Sir Dillon Bevan

1841

ROBERTO L LUACES

INGENIERO AGRÓNOMO

LUGAREÑO 96, CAMAGUEY.

MEMOIRS

OF THE

PHILADELPHIA SOCIETY

FOR PROMOTING AGRICULTURE;

CONTAINING

COMMUNICATIONS ON VARIOUS SUBJECTS

IN

HUSBANDRY AND RURAL AFFAIRS.

VOL. V.

"Let us cultivate the ground, that the poor as well as the rich, may be filled; and "happiness and peace be established throughout our borders."

Tentanda Via est, qua nos quoque possimus tollere Humo :——

PHILADELPHIA:

PUBLISHED BY ROBERT H. SMALL,

No. 165, CHESNUT STREET.

1826.

Eastern District of Pennsylvania, to wit:

BE IT REMEMBERED, That on the ninth day of February, in the fiftieth year of the Independence of the United States of America, A. D. 1826, Robert H. Small, of the said district, has deposited in this Office the Title of a Book, the right whereof he claims as Proprietor, in the words following, to wit:

L.S.

"Memoirs of the Philadelphia Society for promoting Agriculture; containing Communications on various Subjects in Husbandry and Rural Affairs.—Vol. V."

"Let us cultivate the ground, that the poor as well as the rich may be filled; and "happiness and peace be established throughout our borders."

Tentanda Via est, qua nos quoque possimus tollere Humo :——

In conformity to the Act of the Congress of the United States, intituled "An Act for the encouragement of learning, by securing the copies of maps, charts, and books, to the authors and proprietors of such copies, during the times therein mentioned." And also to the Act, entitled, "An Act supplementary to an Act, entitled, 'An Act for the encouragement of learning, by securing the copies of maps, charts, and books, to the authors and proprietors of such copies during the times therein mentioned;' and extending the benefits thereof to the arts of designing, engraving, and etching historical and other prints."

D. CALDWELL,
Clerk of the Eastern District of Pennsylvania.

CONTENTS.

MEMOIRS.

* The implement mentioned by Mr. Linton has not been found to answer the purpose intended by it.

PREFACE.

HAPPILY arrived in the FORTIETH year of our existence as a Society, we venture to publish our FIFTH VOLUME OF MEMOIRS. We look back with delight, on our early endeavours to produce the present most encouraging examples of that prosperity, which pervades every quarter of our Union. Mortifying, indeed, were our early prospects, when we had, almost alone, both collectively and individually, to contend against the prejudices which have, now, in a great degree, vanished from the great body of our farming fellow-citizens; though yet remaining, in deplorable plenty, among too many of those whose interest and happiness it has been our constant aim to promote. To us, who began the great work, without auxiliaries, it affords the highest gratification, to perceive the brilliant contrast to our labours, and too often, inefficient exertions, to conquer the apathy of many, and the prejudices of the greatest number of those who valued themselves on *practical* knowledge, which induced them to despise information adapted to change inveterate habits; or introduce modes of farming to which they and their forefathers had not been accustomed. Few of our fellow citizens of other professions, were, in early times, sensible of the necessity of their assistance to farmers; by bestowing part of their wealth, much of their scientific acquirements, and some portion of their time to the aid and improvement of an art, yet imperfect, but essential to the support of all other employments, and indispensably necessary to the comfort and existence of every member of our community, be his station in life what it may. *Now*, we see, throughout our country, Agricultural Associations, consisting of members the most distinguished and influential. Wealth, talent, zeal, and practical skill, are all enlisted in the great cause wherein we were the forerunners; and though still the ardent supporters, often the almost hopeless, but never the despairing promoters. Our sensations are truly alive to past recollections, and present enjoyments, and we feel

ourselves amply repaid for all our toils and anxieties, viewing with delight the existing practical results.

We have no reason to complain of the want of circulation of our former volumes, whereof a copy is now rarely to be purchased, though some have passed through two editions. We perceive occasionally, that many things are brought forward as novelties, which will be found in our MEMOIRS; either in full description, or incipient suggestions. We do not mention this boastingly, but regretfully, in proof of the want of attention in those who should devote some of their time to the perusal of every work on the important subject; so interesting to every proprietor of our soil, as well as to those to whom it furnishes not only their daily sustenance, but the materials for manufactures, and the objects of commercial pursuits.

We have reason to know that our volumes are, not only in our own country, but in *Europe*, in flattering estimation among those whose opinions we value. We shall continue our intercourse with the other hemisphere, and thus benefit our own country, receiving and promulgating agricultural information, scientific and practical, in addition to that furnished by our own citizens, whose exertions we shall continue to assist and encourage.

The farmers in the vicinity of our cities, and particularly of Philadelphia, will find ere long, that they must change their present modes, and substitute other products in place of those now commonly cultivated; which can be brought from great distances, and furnished at a cheaper rate than can be afforded by those who inhabit the neighbourhood of the city. *Time* will shew what this change, and the objects of it, should be. Our farming must be accommodated to circumstances produced by the extensive public improvements, now in contemplation, for facilitating the communications of the distant parts of our country with the city, which will become a great *manufacturing*, as well as *commercial Emporium*; and thus increase in its population, and create demands for every product which farmers, both far and near, bring to market. It will be the duty, as it is the inclination, of this and all other agricultural associations, to advise, from time to time, our farmers on this subject. Experience will prove *here*, as it has indisputably done in *Europe*, that all apprehensions of lessening the value of lands, or of deteriorating the products of those in the neighbourhood of our city, occasioned

by the influx of distant articles of trade or consumption, are entirely groundless. Although interferences may occur whilst public improvements are progressing, they will gradually diminish; and when the communication with the western waters shall be completed, the transportation will be engaged chiefly in articles found in the earth, or manufactured from minerals and other subterraneous supplies, whereof our country affords inexhaustible abundance.

This exuberant plenty of raw materials, particularly *coal* and *iron*, will raise up factories, which will increase population, and invite new settlers in our forests, and countries bordering upon them. Thus the cultivators of the soil, in those regions, will find markets at their doors, sufficient to require the great proportion of their products. This will supersede the necessity of conveying them to our city; and give to those in its vicinity every demand for *their* produce, which they can reasonably desire.

But, in fact the low prices of esculents which have heretofore been the objects of *Commerce*, are attributable to the present state of the civilized world. Our extra supplies are not essential, as they have been, to other nations. We must look at home for consumption. If *farmers* must change the objects of culture, *merchants* will change the channels and objects of trade. *Agriculture*, *commerce*, and *manufactures*, are sympathetic; and accommodate their plans to suit each other. *Coal* and *iron* will, ere long, become objects of export, in addition to commodities manufactured from these and other materials. No country on the globe has, in these respects, more promising prospects of advantages, than are those now only dawning upon us.

This is not the place to enter into the necessary discussions on that subject. It is only now required to call on our farmers to *begin* their plans for future operations in husbandry, so as to accommodate them to the change, which circumstances will inevitably produce.

The benefits which will be received by the farmers, within the limits of an exploration we have deemed it practicable for us to make, have induced the Society, at a considerable expense, chiefly out of our own personal funds, to procure a GEOLOGICAL SURVEY of the lands comprehended within the segment of a circle, whereof the rotunda, or late water-works in High-Street,

is the centre, with radii extending 15 miles therefrom; to its periphery. This will shew the varieties and composition of the soils comprehended within its bounds, enable farmers to accommodate their operations to their respective localities; and furnish all other citizens requiring such knowledge, with the necessary information for any uses to which the component parts of those soils can be applied. It was intended to publish the report of this survey in our present volume, but it was concluded to be most convenient, to make such publication in a pamphlet, for more general circulation among those more interested in its contents, than are those residing out of its limits. The circulation of our volume within the limits of this geological survey, cannot be expected to be so general, as to furnish the inhabitants of Philadelphia, and the country adjacent, with the information they respectively require. And to those beyond its bounds, the survey will be of small comparative importance. We mention this effort to serve the interests of farmers and other citizens, to shew our unremitting desire to promote their prosperity.

It has been customary to prefix to our volumes, the Addresses delivered before the Society, at their Annual Meetings. Those Addresses have become numerous, and each so highly respectable, that we could not select any in preference; and the publication of the whole, would increase our volume to an extent beyond reasonable limits. In order, however, that the beginning and progress of our Society, and the objects of its institution, may not be forgotten, amidst the laudable display of modern and highly estimable societies, we select a few passages from an address of our President, delivered in 1823. The success attending our constancy and perseverance, will animate those now in the career of Agricultural usefulness, to persist, and bring to perfection the all important art. We do not say it vainglorioously, but that the present associations may, in future times, be respected, when their exertions *should* be remembered by those who reap their benefits. —"Remember thy father and thy mother; that thy days may be long in the *land* which the Lord thy God hath given unto thee." The moral of this sacred injunction, though addressed to individuals, is, nevertheless, applicable to and obligatory on bodies of men, who have received advantages, or entitled themselves to

the grateful remembrance of those whose interests are faithfully served.

"It is not with any conviction of my capacity to throw on the subject of our insti-"tution any new lights, or to bring forward any new incitements to our zeal, that "I have, from necessity, consented to pronounce a plain and narrative, and I fear, "desultory address on this THIRTY-EIGHTH annual return of the season in which our "Society commenced its disinterested and useful labours. It was formed in 1785, "by a number of the most respectable citizens, whose views were not biassed by "any selfish motives; for few of them had any *direct* interest in the subject Their "objects were purely patriotic; and calculated to serve the interest of *Husbandmen;* "without any prospects of emolument or even *fame* accruing to themselves. They "perceived, with regret, that no such associations existed in any other part of our "country; or, if in existence, no publicity was given to their proceedings. Sensible "of the necessity of encouraging and informing the practisers of the art on which "the prosperity of our country mainly depends, they spared neither necessary ex-"expense, nor zealous endeavours, to accomplish their ends. Their task was dif-"ficult, for their influence, among practical farmers, was neutralised by almost un-"conquerable prejudices. Few believed that those who did not follow the plough, "could possibly advise or direct the tillers of the soil. They persevered with unre-"mitting endeavours, till many among the intelligent farmers, not only in our own, "but in other States, were convinced of, and assisted their usefulness. I reverence "their memory, having well known their pure and patriotic excitements to well doing. "I was, then, one of the few practical farmers among them I profited by the instruct-"ive lessons promulgated by this infant association. and gratefully returned my obli-"gations in every way my capacity and power enabled me. Being almost the only survi-"vor of those who first formed our Society, I think myself bound to pay my thankful "tribute to the memory of my departed coadjutors and friends. To them and their suc-"cessors, our country is indebted, for at least the rudiments of the agricultural zea "and intelligence which now so happily, and so generally, pervade our Union And "if, by the progress of improvement, and the increase of means—favoured by more "enlightened views of the subject, among those whose prosperity was the object of "their aim—their early endeavours have been outdone; their merit is not the less "praiseworthy. The seed, then sown with more zeal than hope, has fallen in a "fertile soil, and the harvest is abundant. Part of their original design, was to pro-"mote the formation of societies similar to their own. Long indeed was the ac-"complishment of this most desirable object delayed; but I have lived to see, by a "kind of spontaneous and general conviction, such associations widely spread "throughout our country. And if, with more means, but not with more zeal, some "of them have given more brilliant and repeated instances of active exertions, than "our limited resources have enabled us to exhibit, it affords to me the most pure "and unalloyed delight. Through a gloomy period of apathy—among our rural "fellow citizens particularly—we kept alive the fire on the altar of our devotion to "the great and leading interest of our country. Many have lit their torches at our "constant, if not always lambent, flame; and the brighter they burn, the more they "contribute to our most sincere satisfaction—solid, not boastful; admiring, not in-"vidious.

"It was the earnest wish of our Society, that *our* State should set the example of "providing not only for the practical, but the scientific, instruction of our farmers. "So long ago as the year 1794, a plan was drawn up by myself, and approved by

"my able and highly respectable coadjutors, '*For establishing a State Society of "Agriculture;*' wherein will be found every facility for promoting agricultural "knowledge, scientific as well as practical. Among such facilities was that of con- "necting the education of youth with the instruction afforded to those in advanced "life; and thus grounding the rising generation in the knowledge of the most im- "portant of all arts, while they are acquiring other useful knowledge suitable for "the agricultural citizens of the state. This plan was laid before our *then* Legisla- "ture. Every endeavour was used for its adoption; but *that* Legislature, nor their "successors—with whom I faithfully laboured, could be prevailed on to give their "sanction to an arrangement so highly important. This plan will be seen in our "first volume of Memoirs. It was printed in a small pamphlet and the papers of "the day; and had it not been recorded in our volume, would have been lost and "forgotten. I know this to have been the fate of a multitude of the early literary "and practical, and many of them very able, productions of our Society, and its "members; which were intrusted to the ephemeral and fugitive promulgations of "newspapers. This misfortune induced us to collect in volumes, *our* papers; which "are in general circulation and good repute. They nevertheless did great service, "in laying a foundation on which the present superstructure is built. Although "our Society would have been merged in a plan so general and superior, we were "content to become humble partakers in its provisions, never having aimed at tak- "ing the lead; but always ready to aid in any plan for promoting the agricultural "and fundamental prosperity of our rural fellow citizens.

"It is not to be wondered at, however deeply it is to be regretted, that our State "legislators were thus blind to the interests and comforts of their constituents, when "it is recollected that our great and wise AGRICULTURIST, as well as STATESMAN, "—the immortal WASHINGTON,—failed in his endeavours to prevail on the na- "tional Legislature, to establish a national professorship of Agriculture. This would "have spread, universally, a conviction that *Science* is the handmaid, most essen- "tially administering instruction to the art, which, although the most ancient of all "others, remains to this day imperfect; and too much dependant on practical facts, "and the honest but often mistaken pride of individual performances;—too fre- "quently discordant, and destitute of leading principles to guide in practical results. "It is devoutly to be wished, that our Legislature would assist in the means of en- "dowing a professorship, in the most important of all subjects on which science can "be employed.—Important indeed:—for it is the source from which flows the sub- "sistence of all other artists, and the origin of the most necessary materials of the "useful arts."

In another part of the Address, he enumerates the *premiums,* and their objects, offered by the Society at its commencement, and still continued. They will appear in our former volumes; and comprehend, for the most part, all the leading subjects now in progress, under the patronage and encouragement of modern associations. *A pattern farm and a veterinary institution,* among those subjects are impressively conspicuous.

By this enumeration it will appear, that there are few subjects now in agitation among farmers, which have not claimed and received the attention of our Society. Among those subjects, our successful exertions to obtain the establishment of County

Societies throughout our State, and the instrumentality* we have occasionally had in establishing or recommending such Societies in other States ; afford to us the most pleasing reflections. We mention the foregoing subjects, not with any view to blazon our exertions ; but to evince our unceasing endeavours to effect the objects of our institution.

We have "cast our bread on the waters," and are now, "after many days," gathering it in the satisfaction we derive from the benefits enjoyed by others ; for, we can truly say, that no selfish motives have ever influenced our conduct.

Animated by the same zeal with which we began our career, we have deemed ourselves bound to contribute our share to the common stock of agricultural information, now so generally spread through our singularly happy country. We rely, whatever may be its comparative merits, on the indulgence and favourable reception our former volumes have experienced.

It should always be borne in mind, that our *Memoirs* are not, nor from their nature can they be, intended for any regular classification or code. They, like all such collections, may afford materials for a regular system ; and collected in our volumes, they will be preserved from destruction and oblivion, which generally attend publications in the fugitive papers of the day.

☞ The map referred to in the paper by Mark Reeve, on New Jersey Marl, was lost:—and the implement mentioned in p. 135. by Mr. Linton, not having been found to answer the object for which it was intended, a plate of it is omitted.

* See the Appendix for the Memorial of the Society to the Legislature, on this subject.

OFFICERS

OF THE

PHILADELPHIA SOCIETY FOR PROMOTING AGRICULTURE.

Elected at the Annual Meeting, January 17th, 1826.

PRESIDENT.

RICHARD PETERS.

VICE-PRESIDENTS.

WILLIAM TILGHMAN, NICHOLAS BIDDLE,
JAMES MEASE, ISAAC C. JONES.

TREASURER.

WILLIAM M. WALMSLEY.

SECRETARY.

WILLIAM S. WARDER.

CURATORS.

REUBEN HAINES, JEREMIAH WARDER,
ROBERTS VAUX, JOHN HARE POWEL.
STEPHEN DUNCAN,

LIBRARIAN.

WILLIAM S. WARDER.

CORRESPONDING COMMITTEE.

RICHARD PETERS, ZACCHEUS COLLINS,
WILLIAM TILGHMAN, JOHN VAUGHAN.
JAMES MEASE,

PREMIUMS

Proposed by the Society in 1825, *and at the Annual Meeting, January* 17*th*, 1826.

1. A Gold Medal of the value of fifty dollars to the person who shall have carried on farming in Pennsylvania on the largest scale, without using, or suffering to be used on his property, any ardent spirits, (except when prescribed by a physiciao) for the period of two years.

2. The Silver Medal of the Society to the Farmer who, previous to the 1st of January, 1827, shall have made the most extensive, and the most useful experiment in this State, on the use of Fish as a manure.

3. The Silver Medal of the Society for the best experiment of applying a stream or other source of water to a field, in a way the least expensive, and so as to secure the supply. The Society reserves the right of rejecting any claim, which they shall not consider worthy of the premium.

4. Fifty Dollars, or a Gold Medal of that value, for the greatest quantity of sewing Silk, made from Cocoons of Silk Worms, which have been bred in Pennsylvania, and fed on the White or Italian Mulberry Tree.

5 Twenty-five Dollars for the best Treatise on the Culture of the Italian Mulberry Tree, and on the breeding and management of Silk Worms, the result of practice in the United States.

6. A Silver Cup value Fifty Dollars, for the best specimen of Wool, adapted to the Manufacture of Superfine Broad Cloth; reference being had to the form, properties, and characteristics of the sheep, fitting it for the production of high flavoured mutton, with light offal.

7. A Silver Cup value Fifty Dollars, for the best specimen of long or combing Wool; reference being had to the form, properties, and characteristics of the animal, affording most flesh and tallow, with least offal.

8. A silver cup, value Twenty-five Dollars, for the best Potatoes produced from the seeds of the Apples; reference to be had to the product and quality of the root.

Extract from the Minutes.

W. S. WARDER, *Secretary*.

MEMBERS RECENTLY ELECTED.

Resident Member.

Comegys Paul, Philadelphia County.

Honorary Members.

Count Von Hazzi, Munich.
Thomas Wistar, jr. Montgomery County, Penn.
Thomas Nuttall, Cambridge, Professor of Botany to the Massachusetts Agricultural Society.

DIRECTIONS TO THE BINDER.

1. Conard's Corn Drill, to face - - page 101
2. Tide Trunk, and the Easy Weeder, to face 123
3. The description contained in a loose leaf, to come in there also.
4. Collinge's Hinges to come in after the last article in the Appendix

ERRATA.

Page 98, line 15, for "furrowed" *read* farmed.
99, line 1, for "John" *read* Isaac.
100, line 16, between "as" and "the" *add* when.

Omission.—The paper on New Jersey Marl, by Mark Reeve, was addressed to the President.

PHILADELPHIA SOCIETY

FOR

PROMOTING AGRICULTURE.

THE SOCIETY was incorporated in the year one thousand eight hundred and nine, for the term of ten years; at the expiration of which the following charter was granted:—

AN ACT

To incorporate the Philadelphia Society for promoting Agriculture.

SECT. 1. *BE it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same,* That the persons who now constitute the Philadelphia Society for Promoting Agriculture, or who shall hereafter be admitted members of the same, shall be, and hereby are declared to be a body politic and corporate for the term of twenty years from and after the passing of this act, by the name and style of "The Philadelphia Society for Promoting Agriculture," to have succession, to plead and be impleaded, sue and be sued in all courts of record or elsewhere, and be capable to take, hold and enjoy lands, tenements and hereditaments, goods and chattels, and the same from time to time to sell, grant, demise, alien and dispose of, to use a common seal, and to alter or renew the same at pleasure: *Provided,* That the clear yearly value of the real

estate by them held shall at no time exceed the sum of six thousand dollars.

SECT. 2. *And be it further enacted by the authority aforesaid*, That the officers of the said corporation shall consist of a President, two Vice-Presidents, Teasurer, Secretary, and such other officers as the said corporation may think necessary, who shall be elected annually or otherwise, as the rules and by-laws of the corporation may direct.

SECT. 3. *And be it further enacted by the authority aforesaid*, That the said corporation when convened, upon due notice given to the members by public advertisement or otherwise, shall have power and authority to make, ordain and establish, such and so many rules, by-laws and ordinances relating to the times of meeting, the admission of members, the powers and duties of the officers thereof, and the ordering of the other concerns of the said corporation as they may deem necessary and proper: *Provided*, That no rule, by-law or ordinance as aforesaid, shall be valid if inconsistent with the constitution and laws of this State or of the United States.

SECT. 4. *And be it further enacted by the authority aforesaid*, That the present officers of the said society shall continue in their respective stations until an election shall be made under this act, and the rules, by-laws and ordinances now in force, not inconsistent with the constitution and laws of this State or of the United States, shall be good and valid until altered, amended or abrogated by the corporation.

REES HILL,
Speaker of the House of Representatives.

ISAAC WEAVER,
Speaker of the Senate.

APPROVED—The twenty-seventh day of March, one thousand eight hundred and nineteen.

WILLIAM FINDLAY.

LAWS

OF

THE PHILADELPHIA SOCIETY

FOR PROMOTING AGRICULTURE.

I.—NAME OF THE SOCIETY.

The Society shall be styled, THE PHILADELPHIA SOCIETY FOR PROMOTING AGRICULTURE.

II.—OBJECTS OF THE SOCIETY.

The Society's attention shall be confined to agriculture and rural affairs.

III.—OFFICERS AND MODES OF ELECTION.

The Society shall have a President, and four Vice-Presidents, a Treasurer, five Curators, a Secretary and an Assistant Secretary and Librarian, all of whom shall be annually elected by the tickets of a majority of the members present at the stated meeting of the Society in January; the officers not then elected may be chosen at any stated meeting thereafter on being nominated at a preceding meeting, and such intention shall be duly notified in a public news-paper and in a reasonable time before the meeting, at which a choice is to be made. The persons, so elected, to continue in office one year, and until others are chosen in their stead. In case of any vacancy, by death, resignation, or otherwise, the same may be supplied by a new election, to be made at any stated meeting of the Society, the person thus newly elected to serve the remainder of the year.

IV.—OF A QUORUM.

A quorum for business shall consist of at least five members, including the President or Vice-President.

V.—DUTY OF THE PRESIDENT, VICE-PRESIDENT OR CHAIRMAN.

At all meetings of the Society the President shall exercise the usual duties of that office; all motions shall be addressed to him, and on all questions he shall collect and declare the votes including his own; he shall also have the power to call special meetings of the Society, but all special meetings and their objects shall be notified by the Secretary and published in two or more city news-papers, at least eight days before any special meetings shall take place; in his absence the same duties shall be performed by a Vice-President; and if it happen, at any meeting of the Society, that the President and Vice Presidents be absent, the members present being a quorum to constitute a regular meeting for the business to be transacted, may choose a chairman for that meeting.

VI.—DUTY OF THE TREASURER.

The Treasurer shall keep the accounts methodically stated, in the books of the Society, and when called upon, produce them for inspection. At the last meeting of every year, and also when his office ends, he shall produce a fair and regular account of all receipts, payments and expenditures: and deliver it, together with those books, and all other property of the Society, in his hands, to his successor in office, or to the order of the Society.

VII.—DUTY OF THE CURATORS.

The Curators are to take charge and care of all property and articles belonging to the Society, the books and papers excepted, which are to remain in charge of the Secretary: the Library to be under the care of the Librarian, who is to assist the Curators in every thing in which his aid is required. The Curators are to take measures from time to time, for collecting all native fossils and earthy substances proper for manures, or deemed to be so, and to cause or procure the same to be analysed, and report to the Society the result. They are also to procure experiments to be made by

careful agriculturalists, of any such fossils, earths or substances, and to promote in every practicable way explorations, for the discovery of native substances, either known or presumed to be manures or auxiliaries in fertilising land. They are also to keep minutes of their proceedings, to collect models of the best agricultural instruments, and report their usefulness and properties, and cause such models to be deposited in the apartments of the Society; they are to recommend to the Society from time to time the offering of premiums, for any discovery or experiment on the foregoing subjects, and to examine into the merits of all claims for premiums and report their opinion thereon, when the Society do not think proper to appoint special committees for that purpose.

VIII.—DUTY OF THE SECRETARY.

The Secretary and his assistant shall have in charge all books and papers of the Society, and keep the same in exact order; they shall register all letters which shall be written by the committee of correspondence, or by themselves, by order of the committee.

IX.—COMMITTEE OF CORRESPONDENCE AND ACCOUNTS.

At the annual meeting of the Society in January, shall be chosen a committee of correspondence, to consist of five members, any three of whom to be a quorum, for the purpose of corresponding with any other Society, or persons, touching the objects which this Society has in view. The same members shall also be a committee of accounts, to receive and adjust all claims against the Society, and their certificate shall authorise the President or a Vice-President, to issue orders on the Treasurer for the payment of them, but nothing herein contained shall preclude the right of the Society to pass or refer any account at a regular meeting.

X.—TIME OF STATED MEETINGS.

The stated meetings of the Society shall be held the third Tuesday of every month.

XI.—OF RESIDENT AND HONORARY MEMBERS.

The members of the Society shall be distinguished into

resident, honorary, and contributing members. Resident members shall consist of members residing within a convenient distance to attend the meetings of the Society in Philadelphia, and those are defined to be such only as, at the time of the election, reside within ten miles of the said city, on either side of the Delaware. All members of agricultural societies in other States and counties, with whom this Society shall correspond, and all persons of this State, and of other States and counties, who shall be elected for the purpose, shall be honorary members; and are hereby invited to assist at the meetings, whenever they come to Philadelphia. Strangers who desire to be present, as auditors, may be introduced by a resident member. Honorary contributing members are of the description hereafter mentioned.

XII.—HONORARY CONTRIBUTING MEMBERS.

Every citizen contributing and paying into the hands of the Treasurer, a sum not less than fifty dollars, may be elected agreeably to the rules, an honorary member; those who thus laudably enable the Society to extend its usefulness and promote its objects, are invited to assist at its meetings: they will be styled honorary contributing members.

XIII.—OF DONATIONS AND BEQUESTS.

All donations and bequests for general purposes, shall be faithfully used, and regular accounts kept of their applications. Such donations or bequests as are given, granted, made or devised, on terms directing their being used in, or applied to, any particular purpose, shall with all due fidelity be so used or applied, and if they, or any of them, shall not be at the time sufficient to accomplish the object designated, in whole or in part, they and every of them shall be placed in a situation (if practicable) to accumulate until by addition of other means, the objects intended can be effectuated. The names, amount, and description, of donations of all citizens, contributing pecuniary or other donations of any amount or description whatever, shall be registered in a roll, kept for that special purpose. They well merit and receive the thanks of the Society, for the patriotism and pub-

lic spirit evinced by their thus affording the means of accomplishing the objects of the institution.

XIV.—ELECTION OF MEMBERS.

New members, whether resident or honorary, shall be elected by ballot, and the Secretary shall issue notices to each person of his being elected to the following purport: The Philadelphia Society for Promoting Agriculture, have elected a resident or honorary member, in testimony of their confidence in his capacity and inclination to promote the objects of their Institution.

XV.—ELECTIONS OF MEMBERS AND OFFICERS.

All elections and appointments, except of the officers of the Society, shall take place at one of the stated meetings of the Society, and no person shall be elected a member, whether resident or honorary, unless at a preceding stated meeting, he shall have been openly proposed, and such nomination duly entered on the minutes of the Society; the nomination and election to be in the absence of the candidate. The officers of the Society shall be elected at the annual meetings of the Society, in each year, between the hours of twelve o'clock at noon, and two o'clock P. M.; or in case no election is then made, then at such time thereafter as they may appoint. No member shall be allowed to vote at the annual meeting, unless his arrearages of subscription due the Society be previously paid.

XVI.—OF PREMIUMS.

The Society shall annually, or at any stated meeting, propose prizes upon interesting subjects relative to actual experiments and improvements, and for the best pieces written on proposed subjects; and in order more effectually to disseminate the knowledge of useful discoveries and improvements in husbandry, the Society will from time to time, publish collections of memoirs and observations, selected from such communications as shall be made to them. To promote these views, the friends of agriculture are invited to assist the Society with information of experiments, and incidents in husbandry.

XVII.—CONDITIONS OF PREMIUMS AND RULE FOR THEIR ADJUDICATION.

All claims of prizes shall be sent in writing; and when read, the Society shall determine which of the claims, relative to each prize, shall be selected for their definite judgment, on a future comparison. This judgment is to be given at the stated meeting on the third Tuesday in February, or at any other stated meeting; but previously to such determination, all such claims shall be submitted to, and reported upon by the Curators. If it happen, in any case, that there be no competition for a prize, but only a single claim, the Society will consider such claim; and if the claim or claims be supported answerably to their views and just expectations of the Society, the prize proposed shall be decreed. Prizes and premiums are equally due to any persons residing in any of the United States, according to the merit of their respective exhibitions.

XVIII.—OF ANNUAL PAYMENTS.

For the purpose of defraying the necessary expenses of the Society, for premiums and prizes, books on agriculture, improved implements of husbandry, and other important objects and contingencies, every member shall annually pay to the Treasurer a contribution of FOUR DOLLARS. This contribution shall be considered as due and payable at or before the last day of December in every year.

XIX.—CHANGE OF RESIDENCE OF MEMBERS.

If any resident member shall remove beyond the limits prescribed, he shall not in virtue of his resident membership, be eligible as a candidate for honorary membership, without being regularly proposed as such.

XX.—OF LIFE SUBSCRIPTION.

Any member paying THIRTY DOLLARS shall be considered a member for life, and shall not be called on for any further annual payments.

XXI.—OF MEMBERS IN DEFAULT.

At the first meeting in January, of every year, the Treasurer shall lay before the Society a list of the members, spe-

cifying who have, and who have not paid their contributions, and any member whose contributions shall be found to be more than two years in arrears, after the same shall have become due, and payable aforesaid, provided payment thereof has been personally demanded of him by the Treasurer, or collector authorised by him for the purpose, such member shall be considered as withdrawing from the Society, and be no longer deemed a member of it, and the same shall be entered on the minutes.

XXII.—OF NEW RULES.

New rules or alterations to be made in old rules, except at the annual meeting in January, shall be proposed and the proposal entered on the minutes, at a preceding stated meeting, and may then be made by not less than two-thirds of the members present.

XXIII.—OF DISPOSITION OF THE FUNDS.

When any part of the Society's funds is to be disposed of, excepting at the annual meeting or for ordinary contingent expenses, the same shall be done at a stated meeting, or special one, after having been proposed at a previous stated meeting.

XXIV.

Still further to advance the objects of this institution, the Society will promote the establishment of other similar Societies in the United States.

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FOR

PROMOTING AGRICULTURE.

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On the New-Jersey Marls. By Mark Reeves.

Evesham, (N. J.) 9th mo. 20th, 1815.

I will now endeavour to comply with thy request concerning the marls of New-Jersey. There are several species of them lying in separate and distinct veins, some of which cross the State. To give a better idea of those veins, I have taken off from Watson's map of New Jersey such parts as were requisite for the purpose, and have laid down thereon, those veins as near as my present information will permit. I have laid the lines straight, being most convenient so to do; but in reality such veins are more or less irregular, although the general course may be tolerably direct. The veins, as laid down through the counties of Burlington and Gloucester, I expect will prove tolerably correct. I have traced the gunpowder vein nearly to Oldman's creek, that divides the counties of Gloucester and Salem, and near there I found the general appearance of the land to change; the edge of the pines did not continue on their usual course; I lost the vein of green sand, and I could not find any marl; whether the

vein of marl makes a short turn with the edge of the pines, or whether it there ends, or whether it can be found again at some distance on in the same direction of the veins, my time would not then admit of ascertaining: therefore, in my draft I have ended the veins. As to the other direction north east, my knowledge is quite limited. I know there is marl in that direction across the State; and I know there is marl at Shrewsbury and in the highlands of Neversink; I have seen samples of the isinglass and the gunpowder kinds taken from thence, but how the veins run eastward beyond Burlington county, I am ignorant: therefore, in my map, I have only laid a general vein of marl. Numbers and letters, with notes, will point out on the map the situation of some of the most noted marl beds, and from some of those, when I have leisure, I intend to take samples, and send on for thy inspection. Although the quantity of marl in Jersey is immense, yet there are but few natural situations from which the best kinds can be taken to advantage, on account of the great body of earth found on them in general, and from the wet situation of them in other places. I have made a table of the different species of marl, and thereon have made such observations as will give an outline idea of the different kinds, and their supposed component parts; but in doing that, I have only made a rough guess as they appear upon a common inspection, thinking my rough arrangement and my supposed division of parts will serve as a guide to some abler hand to take up the subject in a scientific manner. The creeks that empty into the Delaware are all short, and only navigable for boats a few miles; therefore, the isinglass vein is only on navigation; and it is remarkable that the gunpowder vein is about the same distance from navigation, from Raccoon to Croswick's creek. The use of marl as a manure, was first discovered by hauling it away from around wells and throwing it down in some

by-place and afterward observing the astonishing growth of vegetables around the spot. Trees that grow on land that has marl within a few feet of its surface, when blown up have their roots flat at the bottom, they not entering the marl; for we dont find the roots of any vegetable in marl of a strong kind as it lies in its natural bed; probably it requires an exposure to the atmosphere to fit it for promoting vegetation; and it is also remarkable that no worm or reptile whatever is ever found in marl. The water which runs from many species of marl, particularly the gunpowder and the black hard kinds, are strongly impregnated with iron, leaving a tinge of that metal on whatever it runs over. All the marls, after a few days exposure to the air in dry weather, have a white frosty appearance on the surface, some of which has an alluminous taste, others not so. The depth or thickness of the strata of marl at present is not much known, there having been but few instances of going through it. Some of the marl lies very compact, and too hard to split up with the spade; others more loose, particularly the gunpowder kind, which will split up very readily; and after getting down into the springs the marl will run into the pit like quicksand. At some places the upper surface of the marl is nearly level for some distance, the inequalities of the ground being occasioned by a greater quantity of earth brought on it; while we find other instances of the marl rising and falling with the surface of the ground, so as to have very much an uniform thickness of earth on it; but there are large meadows of several hundred acres together in which the marl is only covered with a soil from six to eighteen inches, and with an iron ore called iron stone, from a few inches to two feet thick; and where the marl lies near the surface in wet situations, there is generally an iron-stone crust on it, particularly on the gunpowder and the hard marl kinds. The water which runs

from good marl, or that stands in the marl pits, never settles quite clear, but remains of a pale milky white or a light sky blue colour; and in the neighbourhood of the marl where we observe that colour in the small streams, we find good meadow thereon; hence it is probable that those meadows owe the principal part of their fertility to the marly nature of the water which overflows them at times; as it has been proved that water from a marl pit has all the good effects of marl on grass lands. The good effects of marl on land has been known to last for ten or twelve years; but beyond that time little can be said, as it has not been used but a few years. In one instance, ten years after the first dressing, it was repeated, and it had all the good effect of the first dressing, which was very great. One of my neighbours has gone over some of his land the third time with good success. Its good effects are observed by top dressings on grass-lands, Indian corn, potatoes, and all kinds of garden vegetables, and for fruit trees. A few years after a top dressing of the sod is ploughed in, a good crop of any thing may be obtained. Some use it with good success mixed with yard manure, by way of compost on land for wheat and rye, but I prefer it as a top dressing, believing that the atmosphere decomposes it, and fits it for vegetable purposes. The quantity of marl for one acre may be from three to ten and twenty tons; but great effects have been observed the two last years on grass lands, from one to two tons per acre, strewed over by hand early in the spring. There are appearances of marine substances in all the species of marl, and lumps of a metallic kind of ore are found in all the different kinds; but no silicious stones or gravel are found, except in one species, of which I have sent a sample, No. 20. The real genuine marl I suppose to be those black and green particles resembling grains of gunpowder. I have made use of a very simple method of

ascertaining the goodness of marl. Put some of it in a glass, and wash it repeatedly until the water comes off clear, then, by a magnifying glass, the proportion of sand may be discovered; perhaps that part which is washed away may be as valuable as any part of it, for grains of marl pulverised, and put in water, give to the water the same appearance as that part does which is washed away, and it may be ungranulated marl; but I have estimated the value of it by the greater or small proportion of these grains found in it. We are yet ignorant of the part, or what there is in marl which produces such great effects. I have supposed that some marls act only from the sulphureous acid which they contain, and that others act in a double manner, by that and some other substance contained therein. Some of us have an idea that those marls which act the quickest on land are of shorter duration in their effects; but that is yet to be proved. Those iron ores which cover the marl, that pulverise with the winter, have so much of the marly nature in them, as to have much the same effects on some lands as the marl. In many places there is a stratum of fuller's earth over the marl from one to four feet in thickness, and in one place a stratum between two strata of marl. The effects of this fuller's earth on some land are nearly equal to marl; this stratum of earth is commonly divided by separations, a few inches from each other, and falls when digging, into many square irregular pieces, and these division lines are generally tinged with the oxide of iron; this earth is generally more or less sulphureous. Also, in many places over the marl there is a stratum of a brown grey nature, very tough and hard to dig, of from two to six feet in thickness; the owners of some marl-banks oblige the purchasers to take that stuff with the marl, and to strangers it may be put off as such; it contains little or no marl, and is of little worth. In some of the hard marl and gun-

powder kinds, are small indigo specks of about the size of a pins head. One bushel, struck measure, of dry gunpowder marl weighs 102 pounds. All the species have a tendency to loosen and mellow the soil, and give to grass a beautiful green; it is observed that cattle prefer feeding on that part of a pasture that has been marled. The effects of it on some of our poor thin meadows are extraordinary, destroying Indian grass, moss, and a kind of grass called kill-cow; and in their places brings on a good crop of white clover and other good grasses. Had we the power of creation, we could not have hit upon a substance to answer our purpose more completely than this, as it will destroy the useless, and in their places bring on good grasses, without more trouble or expense.

There are a variety of shades and mixtures in the different veins, but each has its general characteristic appearance; we never find the gunpowder marl in the isinglass vein, neither do we find this micaceous appearance in the gunpowder or hard marl veins. We find the best marl on and near the middle of the gunpowder vein, that on either edge being more sandy, and some of it but of little worth; although, upon a slight examination, little difference would be observed.

The draught will show that the veins of marl run along the north west edge of the barrens, accompanied by a vein of land called green land. We find spurs of this land running over the isinglass vein, but never the other way into the pines. Upon inspecting a map of the United States, we find the Blue Ridge and Alleghany range of mountains run parallel to the general course of the sea coast, from the British lines to the Floridas; that the veins of coal, iron ore, limestone, and some particular veins of land, all take the same direction, and that the veins of marl are governed by the same laws. We will

also perceive that the course of the Delaware, from New Castle to Bordentown, lies in that direction; and that for that distance it exactly divides the sandy land to the Jersey shore, leaving a strip of land between that and the pines, composed of land partaking in nature of the lands on either side, the good and the bad in veins; and in this strip of land, of from ten to fifteen miles, lie the veins of marl.

On the New Jersey Marls. By George Holcombe, M. D. of Allen Town, N. J. September 30, 1815.

THE marls of New Jersey are of two kinds, differing very widely in their nature and properties, viz. Firstly, the calcareous marl, corresponding to the common marls of Europe; and, secondly, the ferruginous marl, which is probably peculiar to the state of New Jersey.

The calcareous marl, originating from the decomposition of sea-shells, is found in inexhaustible quantities, along the sea board in Monmouth county, and extends from thence, in different directions, upwards of 30 miles into the interior of that county. Those immense bluffs and masses of land which form the Highlands of Navesink, are principally composed of marl. The farmers have discovered it to be, like stable manure, of benefit to every kind of soil, and every species of vegetation. Excellent wheat soil is made by spreading it, in sufficient quantities, over light and sandy land.

The richest stable manure is dissipated by a few crops; but marl, if used at first in sufficient quantities, will continue to fertilise much longer.

Calcareous marl appear to fertilise in proportion to the quantity used. This remark is proved by the analysis of Davy. The farmer, consequently, in neighbourhoods in which it abounds, may give to his lands an unlimited fertility; and at an expense that will be but slightly proportioned to the profits of a rich and permanently productive farm.

Marle beds contiguous to navigation, will form, in time, sources of extensive profit to the proprietors. Sloop loads have already been purchased at the Highlands,

and carried from thence to Long Island, by the farmers of that place. And, notwithstanding the expense of freight, labour, and fifty cents per wagon load at the pit, it is regarded as a profitable manure.

The Ferruginous Marl.

The substance which I have denominated ferruginous marl, is found in Monmouth, Burlington, and Glouces-ter counties, in quantities that must be inexhaustible for ages. In fact large sections of these counties are based by it; and the soil may be regarded as an imperfect marl.

The ferruginous marls exhibit such a variety of appearances and properties, that I have thought proper to arrange them into the following classes, viz: The first class, composed of sulphur, sulphuric acid, an oxyd of iron, and based by sand. The second class, composed of an oxyd of iron and coarse sand. The third class, composed of an oxyd of iron, sulphuric acid, and based by pure clay.

The First Class of Ferruginous Marl.

This excellent species of marl is found in abundance in Burlington and Monmouth counties; especially about the head waters of the Rancocas and Crosswick creeks. It is distinguished by its sulphureous smell, its dark grey, black, and sometimes beautiful green colour, and the fine round sand with which it abounds. Sand is so essentially a mark of good marl, that the farmers of Burlington examine the nature of a marly earth by steeping it in water, and observing the quantity of sand that separates. If the quantity should prove considerable, the excellence of the marl is supposed to be established.

The banks and beds of this class of marl, abound with decomposed marine shells, and other marine depositions; such as skeletons of crabs and lobsters, the teeth of shark, &c.: Indeed, wherever ferruginous marl has been discovered, the traces of the sea, are every where observed. This ferruginous marl appears to be nothing more than the result of vegetable and animal matters, blended with sand and clay, in prodigious masses, and formed into its present appearance by time, and the operation of nature.

Second Class of Ferruginous Marl.

The external appearances of this mineral have given it the name of marl. Its constituent parts, however, are nothing but an oxyd of iron and coarse sand. It has never been observed to possess the properties of a manure.

Third Class of Ferruginous Marl.

The third class of marl is found in great abundance. The high banks of Crosswick creek, for many miles, are entirely composed of it. The stratum in some places is remarkably thick, measuring beyond a hundred feet. It is distinguished by a blue colour, a soft and greasy consistence; an astringent taste, and all the common properties of a pure clay. It is exceedingly weighty; and so retentive of water as to cause it to be dug from the pit with much difficulty.

This species of marl is seldom used. The farmers reject it as destructive to vegetation, even in the smallest quantities. But I feel confident, from its component parts; and my own experience, that judiciously managed, it will afford the most satisfactory results. It hastens,

with remarkable rapidity the dissolution of vegetable matter in compost beds, and has been observed occasionally on turfy grounds to throw up an astonishing vegetation. And that its action is not incompatible with vegetable existence, the following fact appears to prove:— A gentleman, for experiment, scattered a handful of herd grass seed* in a bed of clayey marl; the situation of the bed was such as to keep it almost constantly shaded; the seed vegetated, and produced a tuft of the most luxuriant grass I ever beheld.

Of the manner of using the Ferruginous Marl.

The ferruginous marls, (such as the experience of farmers has proved useful) are carted from the pitts in the fall, and exposed in the fields they are intended to cover, to the frosts of the winter. The process of freezing and thawing reduces them to a fine powder, and early in the spring they are scattered, by the shovel, over fields, at the rate of five to twenty wagon loads the acre, varying the quantity according to the nature of the marl, and the quality of the soil. Sometimes they are sprinkled with the hand, after the manner of gypsum, especially in second dressings. Light barren lands will bear but small quantities, and indeed it is doubtful whether such soils are ever immediately benefitted by them, or by any other dressing, except the direct manures. Rough-bound meadows covered with wild grass, and lands rendered barren by long and injudicious management, which generally contain an excess of undecomposed vegetable matter, will bear the greatest quantities, and exhibit the most striking advantages from the use of it.

The ferruginous marls are particularly friendly to the growth of white clover. I have seen exhausted soils and

* *Agrostis Stricta.*

neglected meadows, suddenly assume, after an inconsiderable dressing, the most incredible fertility.

The following cases of extraordinary production I have detailed, to exhibit the surprising effects of ferruginous marl :—

A gentleman in Burlington county grew a very superior crop of Indian corn from a certain field ; a crop of rye (after the Jersey manner) immediately followed it. The same field, the same season, yielded a heavy burden of clover ; and to complete this excessive cropping, exhibited in the fall, as large a growth of buckwheat as the neighbourhood had ever seen. This uncommon productiveness was solely the effect of ferruginous marl. Ten years ago, the field was covered with Indian grass, —an uninclosed barren !

A farm in Monmouth yielded, according to the opinion of an observing neighbour, from ten to twelve bushels of Indian corn per acre. The quantity of grass cut, was limited in the extreme. The free use of marl for twelve years has covered this farm with the richest grasses ; and from one of its fields, the last season, sixty-three bushels of shelled corn were gathered. This, I apprehend, was as fine a crop of corn as any ever grew under the same circumstances in the United States ; it was planted in hills five and a half feet apart, and a considerable portion of the field, for the last twenty years, has not received the benefit of a single shovel of stable manure. The farm has been under tillage for nearly a century.

The marl used in this instance was compounded of the carbonate of lime, an oxyd of iron, and sand, spread over the field at the rate of fifteen wagon loads per acre.

Fields covered with a full dressing of marl, will retain their impression for many years. Spots of ground, spread over with the product of wells, dug upwards of thirty years, are still distinguishable by their superior fertility.

It is necessary, however, that the dressings should be repeated every three or four years.

In the dry and sandy land of Monmouth, it is prized, for potatoes, above stable manure. The quantity of the crop is not so much increased by it, as its quality is improved; and the potatoes ripen several weeks sooner than those brought forward in the ordinary way. Like plaister, the operation of marl seems to be particularly friendly to dry, hilly, and sandy soils; and it is observed to be remarkably active during warm and humid seasons. Fields covered with it sparkle in the morning, after the dews have evaporated from other grounds; and, lastly, like plaister, ferruginous marl is not to be regarded as a direct manure, but rather as the agent that prepares for plants the nourishment they find in the earth, or solicits from the atmosphere.

Although marl has been used with the happiest effect on every species of vegetation that gypsum has been observed to assist; yet, in one important particular, the operation of these minerals is essentially different. Marl is scattered beneficially over wet swards, rough-bound meadows, and cold clay soils—situations in which the gypsum is altogether inert. Does not this fact tend to prove that marl has a double operation, the one resulting from its vitriolic acid, and the other from its proportion of ferruginous matter?

GENERAL OBSERVATIONS.

The use of ferruginous marl will form an epoch in the agricultural memoirs of the State. From its activity, it may be profitably carried to considerable distances.

The use of ferruginous manures cannot be said to be peculiar to the State of New Jersey. The residue of martial pyrites after combustion, which is highly prized

by the Hollanders as a manure,* is a substance which, if blended with sand and clay, would form a compound almost essentially the same as the ferruginous marl of New Jersey. This pyritous residue will be a sub-sulphate of iron. Exposed to the atmosphere, it rapidly decomposes air and water until it is saturated with oxygen, and becomes copperas.

To the above observations on marl, I subjoin the following analysis of the soil of a field in Monmouth county, remarkable for its fertility and the spontaneous production of red clover.

480 grains submitted to experiment, yielded of

Vegetable matter,	30 grs.
Argil,	40 "
Iron and salt, soluble in aqua fortis,	60 "
Insoluble iron and coarse sand,	350 "
	480

Such is the analysis of a soil which, after being cropped almost annually for sixty years, still retains, without the least assistance from stable manure, its remarkable fertility. A single dressing of plaister is sufficient to cover it without seed, with a most luxuriant burden of clover.

A soil very similar to the above, embracing in its extent several thousands of acres, is common to a tract of land in New Jersey, extending from the sea in Monmouth county to the Delaware in Burlington county. Notwithstanding the very small quantity of clay it contains, its retention of humidity is so great as to cause the roads through it to be almost impassable in rainy springs.

* See the account of the preparation and use of this substance, for manure, in the Domestic Encyclopædia, article *Manure*.

Sometimes this species of soil is so ferruginous as to preclude the vegetation of all the grasses. From its extreme tenacity for water, it heaves up during the winter the radicles of plants. Indian corn planted in it, grows luxuriantly until the middle of July, when it is generally destroyed by the action of intense heat on its moist metallic surface. If the season should prove cool, or moderately warm and humid, a very superior crop is the consequence. Oats grow on such soils with astonishing rapidity, but commonly perish about the time of filling.

A certain portion of clay, or of the corbonate of lime, has always been supposed essentially requisite for the composition of a retentive soil. But from what has been related, it appears that a soil, barren from excess of sand, may be rendered highly retentive and productive by the ferruginous marls, without the expense and labour of blending it with clay.

G. Holcombe.

Dr. Mease.

On New Jersey Marls. By George Craft.

Near Woodbury, 4th Mo. 28th, 1815.

I HAVE been within these few days past, to look at the effects of the marl in different places, and it would astonish thee to see the difference from only putting about one bushel of marl, to one square rod on land that is very poor; it makes it have the appearance of land in a high state of cultivation. I saw last season, clover lodge on land of the above description, which had been marled as above described, and was told by one of my friends, that where he had marled some last spring, he had mowed a good crop of clover, and where he did not marl, it was not worth mowing:—that he sowed the ground with wheat last fall, and that there is an evident difference already. Where I put marl last season on some Indian grass it has become a mat of white clover, and in almost every instance that I have seen it is the case, although it has sometimes not taken until the second season. I saw a place where the meadow was not worth mowing until it was marled, and part of it the first season mowed a good crop, and on the other it had no effect, until the second year, and then there was little difference.

Thy friend, GEORGE CRAFT.

P. S. Thou may be assured I think highly of marl, for I have hauled 200 loads last winter, although I have to cart it five miles.

B. B. Howell.

On the New Jersey Marls. By Paul Cooper, Woodbury, Gloucester, N. J. March 27, 1815.

We find, that some of our marls produce almost incredible effects, and often on such soils as gypsum would be entirely useless, on such as low, cold and wet, as well as dry, light, sandy soils, where nothing grows but Indian grass, and trash that will by no means pay for maintaining a fence. It is surprising to see one part of an old field that looks as if a rabbit would almost starve on it, and the other part where from six to ten two horse wagon loads of marl had been spread last spring, which yielded the summer following two tons an acre of beautiful white and red clover, and will this season likewise; and if next fall wheat should be sown, and the next season prove favourable, will no doubt produce an excellent crop of that grain.

The beneficial effects of our marl are seen on all soils that will naturally produce wheat and clover, as well as on such soils as are worthless. Mr. Kirwan tells us the best manure for clayey soils is marl, and that all the books of agriculture are unanimous in this. It has been proved beyond all controversy, that it is a most excellent manure for dry light soils, as well as such as are low, wet, and very poor. Mossy land has been greatly improved by it: indeed I have not heard of any kind of soil that our best marl has not improved where it has been tried. The chocolate coloured, the grey and the gunpowder marls from the branches of Timber creek, have been found excellent. That on Mantua creek, is useful, but not equal to the former.

Dr. Mease.

Analysis of the Green Earth from Rancocas Creek, New Jersey. By Henry Seybert. Read May 22d, 1822.

THIS mineral, of a dark green colour, occurs earthy and granular; it is opake, and without lustre; when breathed upon, it emits an argilaceous odour; specific gravity 2.777; before the blow-pipe it fuses and yields a black vitreous globule.

PRELIMINARY ESSAYS.

A portion of the mineral, finely pulverised, was boiled in water; the filtered liquor, tested with nitrate of barytes, nitrate of silver, and oxalate of ammonia, gave only slight traces of sulphuric and muriatic acids and lime. The liquor, on examination, proved to be free from iron. Muriatic acid occasions no effervesence with this substance.

ANALYSIS.

A. 3 Grammes* of the pure mineral, in the state of a fine powder, were exposed to a red heat, in a platina crucible; the colour became reddish brown; to effect the entire peroxidation of the iron, it was treated with nitric acid, and again calcined at a strong red heat; it then weighed 2.78 grammes, the diminution of weight was 0.22 grammes, but by calculation, it will appear that the protoxide of iron contained in the mineral, must have absorbed 0.074 grammes in passing to the state of peroxide; therefore, the water expelled by calcination amounts to

* A gramme is equal to 15.4457 English grs. Troy weight.

0.294 grammes on 3 grammes, or 9.80 per 100. To prove that the loss by calcination was occasioned by moisture, a portion of the mineral was calcined in a glass retort, and drops of water were thus obtained.

B. The residue of the preceding calcination (A.) was boiled with concentrated muriatic acid, the solution was of a reddish yellow colour, and the insoluble portion became gelatinous; the mixture was evaporated to dryness; it was then treated with water acidulated with muriatic acid, and again moderately evaporated, more water was then added, and the solution was filtered: the silica remaining on the filter, after edulcoration and calcination, weighed 1.495 grammes on 3 grammes, or 49.833 per 100.

C. After the separation of the silica, the liquor (B.) was treated with an excess of subcarbonate of ammonia, which produced a precipitate of a reddish brown colour; this precipitate, after being perfectly washed and strongly calcined, weighed 0.90 grammes; it was repeatedly calcined with caustic potash, until the alumina was completely separated; the alcaline liquor, being of a light yellow colour, indicated the presence of a trace of protoxide of chrome. After the entire separation of the alumina, the peroxide of iron weighed 0.72 grammes, but as the mineral is of a green colour, the iron must be estimated as a protoxide, and the 0.72 grammes of peroxide are equivalent to 0.646 grammes of protoxide on 3 grammes, or 21.533 per 100.—The peroxide of iron was mixed with a trace of lime; when calcined with caustic potash, it gave no *cameleon*, and, therefore, contained no manganese. On estimating the alumina by difference we have 0.18 grammes on 3 grammes, or 6.0 per 100.

D. The liquor (C.) when treated with oxalate of potash, was found to have retained no lime; it was then treated

with phosphate of soda and ammonia, which produced a precipitate of ammoniacal phosphate of magnesia. This precipitate, on exposure to a strong heat, yielded 0.15 grammes of phosphate of magnesia, equivalent to 0.055 grammes of magnesia on 3 grammes, or 1.833 per 100.

E. In recapitulating the above results, the great loss induced me to believe, that this mineral contained a considerable proportion of alkali; in order to ascertain this, 3 grammes, in the state of a fine powder, were boiled with muriatic acid; and, after the entire decomposition was effected, the mixture was evaporated to dryness, the residue was treated with water, and the solution filtered to separate the silica. It was then treated with an excess of subcarbonate of ammonia, and again filtered to separate the precipitate. The filtered liquor was proved by oxalate of ammonia to be free from lime: it was evaporated to dryness, and the saline mass was exposed to a moderate red heat. After the volatilisation of the ammoniacal salts, the fixed residue entered into fusion, and it weighed 0.55 grammes: it was boiled with water, and the solution was filtered to separate the magnesia resulting from the decomposition of the muriate: it weighed 0.07 grammes. The liquor was then evaporated slowly, and small regular, and well defined cubic crystals were thus obtained, which, after being dried and exposed to the air, did not deliquesce. They were dissolved in water, and the concentrated solution treated with muriate of platina, gave a yellow precipitate of muriate of potash and platina, which, owing to its abundance, induced me to believe that the alkali in question was entirely potash. On deducting the 0.07 grammes of magnesia from the 0.55 grammes of muriate of potash and magnesia, we have 0.48 grammes of muriate of potash, equivalent to 0.3036 grammes of potash on 3 grammes, or 10.12 per 100.

According to the above analysis, the constituents of this green earth are,

	per 100 *parts.*
A. Water,	09.800
B. Silica	49.833
C. Protoxide of Iron,	21.533
C. Alumina,	06.000
C. Protoxide of Chrome,	A trace
D. Magnesia,	01.833
E. Potash,	10.120
	99.119
	100.000
	000.881 Loss.

The mineral, which forms the subject of the preceding analysis, was generally believed to be *Marl*, and has been advantageously employed in some situations as a manure. The above results evidently prove that its true nature was not known, and that it must be associated with the green earths of Verona and Cyprus.

On Smut in Wheat. By George Abbott.

Mount Holly, 9th mo. 1st, 1817.

Respected Friend,

Having lately observed a publication of the "Philadelphia Society for promoting agriculture," wherein they invite those possessed of any useful information on certain agricultural subjects therein mentioned, to communicate the same to them, I have taken the liberty to direct this to thee, with a request that it may be laid before the Society, to be made use of as they may judge proper.

Among the subjects on which they request information, is that of the disease in wheat and other grain, called the smut; and having some practical knowledge thereof myself, and being willing to contribute to the general stock of useful information, I am induced to give them the following account of a series of experiments on that destructive disease in grain.

In the summer of 1815, on the approach of harvest, I discovered my crop of wheat much injured with the smut, a disease, to me, till then unknown, except from a vague account I recollected to have had of it some years ago. My crop I judged was about one-third destroyed, and altogether unfit for use until the smut grains were floated out, and the remainder well washed and dried, which, besides the loss of grain, was attended with a great deal of labour and trouble. As I could get no information respecting it in my neighbourhood, as to the origin of, or remedy for, the disease, I had recourse to such agricultural publications as were in my possession, when I found in Dr. *Willich's* Domestic Encyclopædia, a pretty accu-

rate description of it, with the remedies used by the English agriculturalists; and as I had determined on endeavouring to prevent a recurrence of the disease in my succeeding crops, I was governed by my own judgment in the choice of the remedies there prescribed, the principal of which is washing or steeping the seed previously to sowing in lime water, pickel, a solution of arsenic, or diluted sulphuric acid. For chemical reasons, I preferred the last mentioned article. I accordingly, at the approach of seed time, prepared my seed wheat nearly as directed in the above mentioned publication, viz: I took 1½ lbs. of sulphuric acid, to which I added from thirty to forty times as much water, which I found sufficient to float one bushel of the seed at a time, and after agitating it well in the liquid, and skimming off the smut grains, I drained it in a large basket, and then dried it on a floor in an airy apartment. I found it necessary to stir the heap frequently to promote the drying. I found the above quantity of acid sufficient for the preparation of nine or ten bushels of wheat, when economically used. The drying of the seed was necessary to prevent the acid from injuring the hands, clothes, &c. of the person sowing it. This seed I sowed in the autumn of 1815, but not having prepared quite seed enough for sowing all the ground I had allotted for wheat, I took from my granary a sufficiency of the same parcel, out of which that prepared had been taken, and without any washing or preparation whatever, finished sowing the remaining ground, which was about twenty rods long by one wide. The result on the succeeding harvest was highly gratifying. I then found that all the grain where the seed had been prepared with the acid was entirely clear of the smut, and of a fine quality; while that from the unwashed seed was much injured: I am of opinion one-third was destroyed by smut, and altogether unfit for making flour till washed as before mentioned. I

showed both parcels of grain while standing, to several gentlemen, who acknowledged their belief in the utility of the process. The succeeding autumn I again prepared my seed wheat in the same manner as before, and with equal success, the grain, last harvest, being quite clear of the smut, and of good quality. On sowing this crop, I extended my experiments somewhat further than the preceding season. It having been suggested to me, that washing the seed in simple water only, provided it was *well* washed, would answer all the purposes of the acid in preventing the smut, to ascertain the fact, I prepared a small quantity of seed, out of the same bulk, by washing it well in water only; with this I sowed about ten square rods immediately adjoining that which had been prepared with the acid. At the same time I sowed a like quantity of the same kind of seed, (next adjoining the last mentioned) without any washing or preparation whatever. Beyond that again, as well as across the further end of the two last mentioned kinds, I sowed the seed prepared as at first, with the acid. On the approach of harvest, I readily discovered the difference in the respective parcels; that prepared with the acid being entirely clear of the smut, as before mentioned, while that washed in water only, as well as that not washed or prepared in any way, were both considerably injured by it, with no sensible difference between them in the extent of the disease. This grain was also shown to several of my neighbours, who were perfectly convinced of the utility of the process, and the accuracy of the experiment. From the complete success of these experiments, I can no longer entertain a doubt that the disease alluded to, may be prevented by the above treatment of the seed-wheat previously to sowing, and can confidently recommend it as worthy the attention of every farmer who cultivates wheat.

I would further just observe, that the kinds of wheat

mentioned as being destroyed the first season were the white wheat, and the red-chaff bearded wheat; both were injured, though the white much more than the bearded wheat: since that time I have sown the bearded only.

I would further observe, that the origin or cause of smut in grain has not, as yet, been well ascertained. The opinion most generally accepted is, that the seed before being sown, is impregnated with the egg of some insect, or contains the insect itself, which insect preys upon the standing grain the succeeding season, and occasions the disease alluded to, and the effect of the acid in preventing it, seems to favour this opinion; but the following facts are in opposition to this theory. Suspecting that the ear or grains of the diseased wheat were affected, and not the root stalk, or blades; I enclosed, soon after harvest, a head in a large phial, properly secured with paper perforated in several places with a pin, to admit fresh air. Nothing appeared till about the beginning of the present month, when I found an insect of the fly or rather bug kind, which appeared to have lately left the grain, the chaff being perforated, and the black dust from the grain fallen through it to the bottom of the glass; since that, several others have made their appearance. This insect resembles, in some degree, the common rose bug, except that it is more arching on the back, is black, and is much less, not being more than the sixth or eighth part of the size of the rose bug. They are active, and fly from one part of the wheat head to another. From this discovery it would appear, that the smut grains were the mere nests or places of deposit for the eggs of an insect of the kind above described, with which it had been impregnated while in its soft or milky state, and which I have no doubt is the true cause of the disease. Admitting this to be the case, it is not easy to account for the remedy or prevention thereof from the application of the sulphuric

acid, or any other substance, to the seed, previously to sowing, after a lapse of eight or nine months from the time of its being sown, except we admit that part of the acid remains in the seed, and enters into the circulating juices or sap of the plant the succeeding season, an idea I do not think very probable; however, be this as it may, the remedy appears certain, and we must leave theory for practice or known facts.

I am, with sentiments of respect,
Thy friend,
GEORGE ABBOTT.

S. W. Conrad.

[Mr. *Abbott's* communication is a valuable addition to the many proofs of the efficacy of *steeps*, and other modes of guarding against the maladies of seed grain. The oil of vitriol is no doubt competent to the purpose. From *Sir Jno. Sinclair's* account of the benefits derived from the Flemish receipt, composed of the solution of *copperas*, it is equally effectual. Barely washing in pure water has answered well in some instances; but it is certainly best to use more powerful remedies. The difficulty is, to prevail on the great body of our farmers to do any thing out of their common routine. Most of what has been written on *smut*, at least enough to give information to those who have a desire to profit by it, will be found in our 1st volume, page 47, and seq.: Mr. *Young's* communication. Page 65, a paper by Dr. *Fothergill*. Appendix to volume I, page 1; and see also Dr. Mease's remarks on Mr. Young's paper, same volume, page 54. And in the Bath Papers, volume xiv, article 3d, will be found a valuable paper on this and other diseases of *wheat*. A curious fact of the efficacy of pure water in preventing injuries from *smut*, is mentioned by Mr. *Eckroyd*, volume I, pages 56, 57.]

R. P.

On Sea Kale. By Samuel Miller, D. D.

Princeton (N. J.) Oct. 13, 1817.

Sir,

My brother-in-law, Mr. Sergeant, informs me that you have expressed a wish to be furnished with some of the seed of the sea-kale, for the purpose of cultivating that delightful vegetable. I do myself the honour to send a parcel herewith, and shall be very glad if the product should answer your expectations.

The sea kale, or *crambe maritima*, has been long known in those parts of Great Britain which border on the sea coast, where it grows wild, in a light, sandy soil. Its introduction into gardens is a recent event. At present, I am informed, it is one of the most favourite articles of cultivation in that country. It is one of the most tender and delicious of all the numerous species of the brassica, or cabbage tribe, not excepting even the cauliflower. It does not, like most cabbages, form a head; and it would be both coarse and tough if it were not bleached. It is a very early plant, being ready for the table ten days or a fortnight before the usual time of beginning to cut asparagus. Like asparagus, it is perennial. When you have once formed a bed of the sea kale, it will continue to produce abundantly, when managed with tolerable care, for a number of years.

I received the first seed which I planted from John Lowell, esquire, of Massachusetts. From his letter, and from my own experience, I am enabled to offer the following directions for cultivating this vegetable.

It delights in a dry, sandy, hungry soil, and requires no manure. In rich and moist land it is said to be apt to rot.

The seed should be deposited in rows, about three feet apart, each way. For this purpose I formed a long bed, slightly raised, and a little wider than a common asparagus bed, in which I made two rows. From three to five seeds ought to be deposited in a place, to provide for failures, which are not uncommon with this kind of seed. After they have come up, all the plants or stools may be removed, excepting one, the most vigorous and promising. As the seed is a long time in coming up, sometimes as much as eight or ten weeks, I found it convenient to mark each place where it was deposited with a little stick, that the plant might be kept free from weeds, and also that the danger of pulling it up with the weeds might be avoided. It ought to be sown about the first of April, or from that to the tenth.

During the first summer and autumn, the plant, if circumstances be favourable to its growth, will send out large, coarse, thick, sea green leaves, which, instead of forming a head, will lie flat on the ground. Some of the most vigorous stools or plants, will cover a space of two and even three feet in diameter. Toward November the leaves will die, and the whole plant will appear as if about to perish. Soon after this takes place, *i. e.* generally about the middle or latter end of November, the whole bed should be covered pretty thick with seaweed, long litter, tan, or some similar substance calculated to preserve it from the frost. If none of these are at hand, the earth may be heaped around each plant, covering it to the depth of several inches. I have always been careful, in covering each root, or stool, in the autumn, (denuded of its leaves, as before described) to mark its situation by a stick, that in the process of un-

covering in the spring, there might be no difficulty in finding the plant, nor any danger of injuring it by an unintentional stroke of the hoe.

In the spring, as soon as the frost is out of the ground, the covering of manure should be removed, and dug round the plants, taking great care not to wound or injure them. Each plant should then be *covered closely* with a garden pot, or a wooden box, or a little fresh tan, or, (which is said to be best of all,) some sea sand should be heaped over it to the height of about one foot. Mr. Lowell uses an earthen pot, which is the neatest and most simple mode of covering and bleaching the plant. On account of the difficulty of getting proper earthen pots in this place, I cover mine with wooden boxes, very carefully made with close joints, and about twelve inches every way. Where none of these can be conveniently had, the common soil, provided it be dry, may be heaped over the plant. But if the season should be wet, the young shoots will be apt to rot.

About the middle of April, sometimes sooner, you may remove the covering, and examine the state of the plant. If it is sufficiently grown, it may be cut. One plant will furnish enough to fill a moderately sized dish. In cutting, great care ought to be taken, not to wound the crown of the plant. It may be cut down to within half an inch of the old crown of the last year. It should be cut but once in a season. Of course, when it is cut, the pot or box should be laid aside, and the plant suffered to grow in the open air, and run to seed, which it will do, every year, with great luxuriance. The bleached shoots, as they appear on removing the pot, are of a most brilliant white, and the tops of a most beautiful violet colour. A more elegant vegetable I never saw.

The process of bleaching and cutting ought not to be too soon commenced. It ought in no case to commence

earlier than the *next spring* after sowing the seed; nor even then, unless during the first summer the plants shall have grown so well, as to cover an extent of ground at least two feet in diameter. The best plan, in general, is to leave them near two years before the process of bleaching is begun; in which case, like asparagus, they will reward your patience, by more vigour and productiveness afterwards.

The *seed* does not appear till the *second year*. And then, even if the plant be strong enough for bleaching and cutting, after the first flowering stem is cut off, it will send up another, and flower, and ripen its seeds. This ripeness is to be determined by the colour of the capsules. When they turn yellow and begin to fall, the stem ought to be cut off and hung up to dry. This will probably be toward the latter end of August, or the beginning of September.

This vegetable requires to be thoroughly boiled; and if boiled in milk, or milk and water, it is more tender and delicious. A little melted butter is usually poured over it when served up. In short, it ought to be cooked and served up very much in the style of asparagus, excepting that it requires *rather more boiling*.

This vegetable, like most others, may be *forced*. For the sake of having a few plants earlier, as well as that the whole crop might not come on at once, I have generally thrown a wheelbarrow full of hot stable manure over each box, to the extent of about a quarter or a third of the bed. The best covering, I believe, for those which are intended to be *forced*, is an *earthen pot;* which will keep the manure from coming in contact with the plant, and, at the same time, be a better conductor of heat than a wooden box. This liberal use of manure will occasion no loss, as it will be on the ground, ready to be used in neighbouring parts of the garden.

The plant ought always to be covered for bleaching, as soon in the spring as the frost is out of the ground, and *before* the vegetation starts.

In the first, and every succeeding fall, the dead leaves should be carefully removed, lest they should rot the crowns of the plants, as they are very large and succulent.

I have generally sown the seed *without* breaking the capsules. Mr. Lowell, however, advises that *some* of the capsules be broken in sowing them. In England it is necessary to sow the seed in the fall, as it will not, there, come up the first year. In this country, it grows the first season as well as any other plant. Mr. Lowell recommends that *some* of the seed be sown in the fall, as he says he has observed that the seed dropped in the autumn, by the plant, usually comes up with great vigour: I take for granted he means in the succeeding spring.

You may perhaps imagine, from the length to which I have extended my directions, that this vegetable is difficult of cultivation. This, however, is by no means the case. Scarcely any article in the garden is more easily raised. I have been minute, perhaps unnecessarily so, that you might not be at a loss with respect to any point.

I have the honour to be, sir, with much respect, your obedient servant,

SAMUEL MILLER.

Richard Peters, Esq.

On Merino Sheep. By Samuel L. Howell.

Ashfield, Gloucester Co. N. J. June 18, 1813.

DEAR SIR,

YOUR letter, with the accompanying certificate, has been duly received and I must trust in your lenity for forgiveness for having suffered it to remain thus long unanswered.

I very much regret that it has not before been in my power to devote that attention to the subject of your letter which required a full and satisfactory answer. The propagation of Merino sheep, has of late engrossed my attention almost to the entire exclusion of agricultural improvement; and from the present size of my flock, I am forced to conform my whole system of farming to their convenience and accommodation. Any knowledge however, which my limited experience may have afforded of the diseases of these animals that can in any wise aid you in your present useful and praiseworthy undertaking, I will most cheerfully communicate; with this proviso however, that you will use the facts, but not the garb, in which they greet you.

In complying with your request on this head, I shall confine myself to those diseases alone, which have come particularly under my observation, and of this number, only to such, as in the late treatises on sheep, have either not been noticed at all, or have been so described as not to accord with my own experience. The worm in the head, prolapsus vaginæ et uteri, abortion, cholera, and foot rot, come properly under this description.

I. *The worm* in the head did not come much into notice, until the last summer, when a considerable alarm was excited among merino-men by its discovery, but their fears were chiefly groundless, for they are now found to exist in a greater or less degree, in the heads of almost all sheep, producing for the most part but little inconvenience and very rarely death. Like the various worms in the human body, especially those of children, they probably become more troublesome when the animal is labouring under disease, when from our great ignorance of its nosology, suspicion is apt to light on them as the cause. I have remarked, that it is only in chronic affections where any appearances of inflammation attend the retreat of the worms, and even then not in a sufficient degree one would suppose, to endanger life: they probably subsist on the mucous secretions of the region in which they exist, and if so, can produce but little irritation. From the head of one ewe, which died during the winter in consequence of lambing, I took twenty of these worms: they were of various sizes, from an eighth to three-fourths of an inch in length, and were all found in the frontal sinuses, but without the smallest appearance of inflammation in the parts. I have recently made a discovery which must render doubtful the theory of this worm's origin. Having a lamb to die in consequence of losing its mother, curiosity induced me to have it examined, and to my great astonishment this miraculous worm, about a quarter of an inch in length, was found snugly stowed away in his accustomed habitation. The lamb was dropped about the first of February, and died in the latter part of March. Can the worm in this case be supposed to have originated from a fly or bee, when from its size it might be supposed to be coeval with the lamb itself? Or must we not rather conclude it to be one

sui generis which, like the worms in the human body, forms a part of the animal economy ?

Should the worm ever prove troublesome to the animal, it might probably be distinguished by its motions and the discharge from its nose, and relief I think, might be afforded by trepanning the exterior bone over the frontal sinuses, in which the worms are chiefly found, about an inch above the socket of the eye, and either drawing them forth with a pair of tweezers, or blowing the smoke of sulphur on them, which would probably drive them down the nostril, whence they might be blown out by the sneezing of the animal, produced by the fumes of the sulphur. The bone over the frontal cavity is very thin, and there is nothing of vital importance intervening to render the operation difficult or dangerous.

II. *Prolapsus Vaginæ.*—This disease seldom, if ever occurs except in advanced stages of pregnancy, and is then oftentimes very troublesome. I have had many cases in my flock, but only the first terminated fatally. In this the inflammation was so excessive, as to render a permanent reduction impracticable: finding therefore that the destruction of both the mother and fœtus would be the inevitable consequence unless speedily relieved, I had recourse to the only remaining alternation ; the cæsarean operation, which was successfully performed. After going through the regular process of killing the ewe, the lamb was preserved and raised, even though ushered into the world, to all appearance a week before its time.

This affection is generally I think to be ascribed to too much blood, but it is oftentimes brought on by the ewes rearing up against the rack in order to feed over the top, which should by all means be prevented. The vagina may generally be reduced by raising the animal up by

the hind legs, and shaking her well while thus suspended, but in cases where it has been of any continuance, a reduction will be found more difficult; it will then be necessary to cleanse the part well with some cooling wash, previously to putting it back, and to use a few sutures to prevent a recurrence, care being taken to remove them on the first symptoms of parturition. I have recourse always to the lancet, both as a remedy and preventive.

III. *Prolapsus Uteri* is a much more alarming affection, though happily more rare in its occurrence. It is confined chiefly to ewes, producing abortions and still born lambs, and always occurs within a few days after delivery. I had two cases in my flock during the month of March, in both of which, the produce was of this description. The uterus in each of these instances, was completely inverted and distended to a most unnatural size, and though it was reduced, and sutures used to keep it in place, yet the continual contractions produced by its excessively irritated state, joined to the straining of the ewe, rendered ineffectual all attempts to keep it back, and both consequently died. On dissecting them, I found that the uterus was still inverted and occupied the whole space of the vagina.

Death however is not the necessary consequence of this affection in all cases. If the uterus had been completely cleansed by some cooling lotion previously to reducing it, and copious bleeding resorted to in the beginning, both my ewes might probably have been saved.* As neither of them had had lambs, I think it likely that this evil is chiefly incident to those of this description,

* An intelligent farmer in the neighbourhood informs me, that he lately succeeded by these means, in restoring one of his ewes.

probably from the greater irritability of the uterus in such.

IV. *Abortion.* The experience of the past winter, has forced me to acknowledge, though reluctantly, the correctness of the vulgar opinion, that ewes, especially those with their first lambs, to breed with certainty, should not be in more than ordinary condition, and should therefore not be *full* fed with grain, or at any rate until within a few weeks of yeaning. This acknowledgment which goes directly to condemn my own mode of management, has only been extorted by the most convincing evidence: for out of twenty-five shearling ewes, the excellence of whose stock induced me to keep them in rare order, fifteen at least produced *abortions*, or dead lambs: and what tends equally to condemn high feeding is, that almost all the cases of prolapsus vaginæ and uteri, which occurred during the past winter, happened in this ill favoured flock.

After thus clearly discovering the ill effects of too much blood, I had recourse to moderate *depletion*, by a gradual reduction of food, and by bleeding, in hopes to remedy the evil. These means I believe were partially useful: but in too many instances, the mischief was already done, though its effects were not immediately perceived.

As bleeding may oftentimes be very useful, and can seldom, when practised in moderation, be injurious, I will here mention my method, which I believe is not generally practised among merino-men; it is, to open the external jugular vein about three inches from the jaw, first shearing away the wool for a small space round the part, and tying a cord tight about the neck below, as in bleeding horses and calves. I use a common spring lancet. In this method a half pint of blood, which I find a full grown sheep will readily spare, may be taken in a couple of minutes.

V. A new and most alarming disease made its appearance in my flock, in the latter part of the past winter, which almost in every instance baffled all attempts at a cure. In its effects it resembled cholera, *though it was in no instance observed to produce vomiting*,* and yet from the sudden debility and apparent anxiety produced by it, it was evident that the stomach was much affected. It generally terminated in ten or twelve hours, from the first appearance of indisposition, and in one or two cases, even in a shorter period, a course so rapid as to render hopeless, the most powerful remedies.

This malady, which, as it corresponds with none as yet described in any treatise on the diseases of sheep which have come under my observation, I shall call *cholera*, commences with a violent purging, accompanied by straining and other marks of pain, but without any striking symptoms of fever. Loss of appetite, great lassitude and coldness of the extremities and tongue soon succeed, with involuntary motions of the head and limbs; and finally the most distressing convulsions are the certain precursors of death.

The most careful examination was made in almost every instance after death, in order to ascertain the cause of this new and extraordinary disease. The appearances were uniformly the same. The contents of the paunch were in a state of excessive fermentation, and looked as if they had been raised by yeast; and yet the stomach itself was not enlarged beyond its natural dimensions: the contents of the other stomach were much more liquid than in healthy sheep, and there was a slight degree of inflammation discernable in all the stomachs, and

* The idea of sheep vomiting may appear a little laughable at first view; but it is a certain fact, that this operation may be produced in them by means similar to those which excite it in our own species.

in the viscera immediately connected therewith. The fæces, which were unusually thin, exhibited a frothy appearance and a yellowish green colour, and contained a large portion of corn, which though thoroughly masticated appeared to have passed through them unchanged, without any part having been taken up into the system.

This latter circumstance furnished the clue that led to the detection of the fatal cause, which was immediately suspected to be Indian-corn; and my suspicions have since been thoroughly confirmed by the following facts:—This fatal disease was confined to the flock which was fed on corn; when this food was discontinued, the disease ceased; when it was afterwards resumed in the form of meal, and mixed with oats, it returned; those affected by it were moreover the strongest and heartiest ewes, which of course would obtain the largest share. Lastly, the lambs of this flock, which alone were observed to purge, had constant access to corn-meal in a small pen or cage, from which the old sheep were excluded. It is further remarkable, that none of my ewes were affected with this disease until after lambing, though they were liberally fed with corn for some time before, as were also the rams, which were yet entirely exempt from it. May not this be owing to some difference in the distribution of the nutritive parts of their food in such ewes as give suck?

In most of the diseases of sheep the trite adage, "that an ounce of prevention is worth a pound of cure," is very applicable, but in none more than in this, as the unexampled rapidity of its progress allowed no time for the operation of remedies. I have used many medicines but for the most part without any important advantage. Of these, castor oil and rhubarb seem to have been most beneficial. In one case, I tried the chalk preparation in large quantities, with considerable additions of laudanum

but it availed nothing. I would therefore caution sheep-breeders, against the use of Indian corn, without a very strict regard to the quantity, more especially for suckling ewes, for though it may be a hearty, invigorating food when given in moderation, I shall ever believe it a dangerous one, where the sheep have it in their power to consume more than a gill at a meal.

VI. *Foot rot.* During the last summer, several sheep in my flock were affected with a disease, which I soon conjectured to be a mild stage of "*the foot rot.*" It made its appearance within the cleft of the hoof towards the heel, at first in a slight irritation where the parts rub together, which was soon followed by the discharge of a watery humour and a separation of that part of the hoof from the skin, attended at the same time by considerable heat in the whole foot, and lameness. The late heavy rains which have kept my pastures constantly wet, have caused its return, and the experience of the present season, has thoroughly confirmed me in the opinion I at first formed. I have now seen this disease in its second stage, as described by Mr. Pictet, in which, suppuration has taken place within the hoof, and considerable quantities of fœtid matter were discharged.

The only remedy I have used is, to cleanse the diseased part thoroughly with strong soap-suds or ley, and wiping it dry, to dip the whole foot in sturgeon oil: sometimes inserting a pledget of rag wet with the oil, within the cleft of the hoof, which defends the sore from dirt, and prevents irritation from the friction of the parts together. One or two dressings of this kind applied in the commencement of the disease, seldom fail to cure.

This disease, which is certainly *not* contagious, may safely be attributed to wet pastures; being confined last summer exclusively to those merinos, which were kept

on meadow pasture, and commencing this season with the wet weather, and ceasing when it became dry.

This disease I believe to be peculiarly incident to merino sheep. I have never known it to affect the natives of our country, or any coarse-woolled foreign sheep; and I have seen but very few instances wherein it has attacked the half bloods, but the crosses, as they approach nearer the full-breed merino, are more subject to it. This opinion is partly corroborated by the experience of an intelligent friend, whose flock last summer consisted of sixty or seventy common ewes and two merino rams. In the latter part of the season they were pastured on his marsh meadow, and the rams were soon perceived to grow very lame. At length one of them became incapable of walking on his feet, pined away, and finally died; but the other being less affected, recovered. His common ewes all escaped the disease.

The cause of this peculiarity I have fancied to exist in the construction of the hoofs of most merinos, which have a wonderful tendency to increase, and, in some instances, if not frequently cut, will grow to a most inconvenient length. To supply this demand, there must, of course, be a greater determination of blood to that part, which will necessarily produce therein a greater sensibility, and consequently, liability to receive injury from the operation of unhealthy agents. Indeed I believe that merino sheep are more subject to every kind of cutaneous disease (for this is certainly of that description in its early stages) than the natives of our country, or in fact any other coarse-woolled sheep, and I am the last person that would say or do aught to bring them into disrepute. I never have seen these latter breeds affected by scab,* or indeed any

* I am perfectly aware of the general belief that our country sheep are equally subject to the scab with the merinos; but my

other disease of the skin, unless pelt-rot, merits that distinction. This is probably attributed to a difference in the construction of that organ in the former breed, which is known to be much more thin and delicate; and from its more abundant produce of wool, and the proportionably greater action of those minute vessels which supply its growth, is doubtless more sensitive, and of necessity more susceptible of disease. This belief is further strengthened by what I consider the fact, that merinos are also subject to eruptions of the skin from coming in contact with poisonous plants when deprived of their fleece. Several individuals of my flock were very *seriously* affected in this way, soon after shearing last summer, which, for a variety of reasons, I do not hesitate to ascribe to the common poison vine, which grew abundantly on the fences of their enclosure.

I have now fulfilled the limits which I prescribed to myself in the commencement of this *epistle*, but I will remark in addition thereto, that in the course of my short experience, I have had my sheep affected oftentimes with the *hoven*, which, when discovered, I have never failed to cure, by giving them a table spoonful of castor oil, and shortly afterwards a gill of ley, sufficiently diluted to destroy its pungency—say with an equal quantity of water. I do not know that the castor oil is actually necessary to the cure; I was first induced to give it in order to defend the coats of the gullet and stomach against the acrid effects of the ley, and finding them jointly effectual, I have not thought it worth while to separate them. I believe, however, that the ley is the principal agent in the cure.

own experience has produced a different conclusion. My merinos, for the greater part of the first year, suffered direfully with that disease, but my common ewes, though they, part of the time, ran with them, and were afterwards occasionally shifted into the infected folds, were entirely free from it.

In the use of ley, as in that of all other acrid medicines, much care is necessary to prevent its passage down the windpipe, which will be the certain consequence of opening wide the mouth in drenching; for deglutition, it is well known, cannot be performed with distended jaws. I once destroyed a valuable ewe by giving her ley, from inattention to this circumstance.

Believe me, very respectfully, and with much esteem,
Yours,

SAMUEL L. HOWELL.

Dr. James Mease.

On Peach Trees. By Nicholas Hammond.

Easton, Talbot Co. (Md.) April 15th, 1817.

Sir,

AMONG the papers published in the third number of the third volume of the Agricultural Journal of the Massachusetts Society, which lately came into my hands, there appears a letter written by you upon the subject of peach trees, mentioning their decline for some years past, and the various remedies employed by you for relieving their diseases and preventing their decay. Well knowing your zeal in whatever can advance the interests of agriculture in any of its branches, I am persuaded you will permit me to state to you an expedient which has been usefully applied to the improvement of fruit trees in this county, and which may be equally serviceable in other districts of the country.

The peach trees here appear to be liable to the same disasters and diseases which you describe; and they often wither and decay in the same manner. Pear trees, and other fruit trees, are also frequently affected, and sometimes suddenly perish, without discovering the causes of their misfortunes.

A gentleman of this vicinity, some years ago, observing the condition of his trees, and having unsuccessfully made many applications, at length directed their trunks or bodies to be washed, and well rubbed with *soft soap;* and it is not easy to imagine the early change which appeared in their bark and foliage. The bark became smooth and glossy, and seemed sound and beautiful; and he thought the tree was considerably improved in every respect. I have tried the same experiment, and with equal advantage, to apple trees, pear, and peach trees; and am satisfied they have been greatly benefited by this process. It is used in the spring, and may be repeated

in following years, as frequently as the trees appear to require it.

It is observed, however, sir, that you employed *soap suds* without any beneficial effects; and, therefore, you may feel the less confidence in the present suggestion. But it is probable that the soft soap, in substance, is more operative; and that having more strength and virtue than the suds, as commonly made, it may more effectually destroy the worms, bugs, and other insects which so materially injure the trees; and it is believed to be chiefly in consequence of their destruction that the bark and branches are enabled to show so much improvement.

It should be added, that one of the pear trees, (the pound pear) did not exhibit this fair appearance after the soap was applied. This was done last spring; and in the course of the summer some of the bark cracked and peeled off; but the tree blossomed very well, and bore a considerable quantity of pears. It now appears in a thriving state, though the bark continues affected in the same manner. This effect upon the bark is so uncommon, that I cannot consent to ascribe it to the soap. It is, moreover, probable that trees of any kind, though not affected by insects, may receive much advantage in their growth and appearance by the application of this article, considering it as an active and substantial manure, descending to their roots by the drippings from the trunks. But it seems to act immediately upon the bark itself; which, from a hard and almost horny state, soon assumes the gloss and smoothness which has been mentioned.

If it shall be your pleasure to make a trial of this supposed remedy, it will give me much satisfaction to learn that the application shall have been successfully used.

I have the honour to be, &c.

NICHOLAS HAMMOND.

Richard Peters, Esq.

Utility of Lime in preserving Fence-posts. By Wm. Webb.

Near Lancaster, (Penn.) 9th mo. (Sept.) 10, 1818.

Believing that the following described mode, to preserve fence-posts from decay in the ground, will answer a good end, and be of great importance to the farmer; the Society, if of the same opinion, will give it that publicity they think it merits.

Accident in some instances, has led to the discovery, that lime applied to wood, preserves it from decay. The white-washing of fences is practised, more as a substitute for paint, and for appearance sake, than to prevent decay. Even this superficial mode of applying lime, is of some use in preserving wood.

Having full confidence in the efficacy of lime, as a preservative of wood, to make fence-posts less subject to rot, I have this season, for the first time, used it as follows. I provided a number of narrow boards, about three feet long of various breadths, and one inch thick, with a hole in the end of each. When the hole in the ground was ready for the reception of the post, some lime was put into it; on this lime the post was placed; some of the narrow boards were then selected, and placed close to and around the post in the hole. The ground was then rammed into the hole, after the usual manner; and when filled, the boards were drawn out. This is done with greater facility, by putting a stick into the hole in the upper end of the board, by which it may be raised by a lever or prise, if too fast to draw out otherwise. The boards being all removed, fill the space they occupied

with quick lime; if but partially, it is better than if totally slaked, because as it slakes it will expand and make the post stand very firm. If altogether slaked, it also swells and makes the post quite secure. From three to five posts, with hewn or uniform butts will require one bushel of lime. Boards to surround the post half an inch thick (and perhaps this thickness of lime may be sufficient) would not take quite half that quantity. The lime is all the additional expense, except the extra labour (which is very trifling,) to be incurred by setting a fence, with that part of the posts in the ground enveloped in lime.

To prevent the ground from adhering to the posts at the surface, and occasioning their decay, this part being the one which generally first begins to rot, lime-mortar is applied, plaistering round the posts with an elevation adjoining to the wood. Into this mortar, gravel was pressed, to prevent the rains from washing it away. This mortar may be applied at any time most convenient after the fence is made.

WILLIAM WEBB.

Roberts Vaux,
Sec'y. Philad. Agric. Soc.

On the Alderney Cow. By Reuben Haines.

Germantown, Oct. 20th, 1818.

With this you will receive a pound of butter made from the Alderney cow, imported in 1815, by Maurice and William Wurts, and now in my possession. She calved on the 13th of last month, and is now in fine condition, running on excellent pasture, of orchard grass and white clover, and gives on an average, about 14 quarts of milk per day. From this quantity, during the week ending the 7th inst. we obtained 10 quarts of cream, which produced 8 lbs. 2 oz. of butter, and the week succeeding, 10½ quarts, which gave 8¾ lbs. of the quality of the sample sent. You will perceive it is of so rich a yellow, that it might be suspected some foreign colouring matter had been added to it, but you may rely on it this is not the case. I may add, that one of the the good properties of this valuable breed of cattle is, the ease with which the cream is churned, requiring but a few minutes to convert it into butter. When a proper opportunity occurs, I shall endeavour to ascertain the quantity and quality of butter to be obtained per week from the Kerry cow, imported this summer from Ireland, and the Brittany cow from France, both of which breeds I have pure.

I remain, very respectfully,

Reuben Haines.

Richard Peters, Esq.

Additional information relative to the produce of the Alderney Cow, imported by M. and W. Wurts, in the year 1815, *mentioned in the 4th volume of our Memoirs.* Read, January 19, 1819.

THIS cow is a full bred Alderney, as will appear from the following certificate:

"*Brixton, Surry, 7th Oct.* 1815.

"I hereby certify, that the cow shipped by Maurice Wurts & Co. in the Catherine and Edward, captain Vickery, has been raised by me from two full bloooded Alderneys which I imported, and that the bull shipped by them in the same vessel, was imported from Alderney by Mr. Allmot of this place.

(Signed) "RICHARD PLATT."

She is now five years and eight months old, and has had four calves: all of which are in my possession and likely to do well, and I hope will tend to improve the quality of the butter sent to our market.

On the 17th of Tenth month, three weeks after the last calving, we churned $10\frac{1}{2}$ quarts of cream, collected from one week's milk which produced $8\frac{3}{4}$ lbs. of the richest and yellowest butter I ever saw; and yesterday, at the end of sixteen weeks upon winter food (brewers' grains and hay, with about one quart of Indian meal daily,) we obtained $7\frac{3}{4}$ lbs. from a week's gathering, of which the following is a detailed statement:

1819. 1st mo. 9	evening	4 qts.	1 hf. pt.
10	morning	5	1
	evening	4	1
11	morning	5	2
	evening	4	2
12	morning	5	2
	evening	4	2
13	morning	6	0
	evening	4	1
14	morning	5	1
	evening	5	0
15	morning	5	1
	evening	4	0
16	morning	4	1
Total		67 qts.	3 hf. pts.

of milk, yielded 8 quarts 1 pint of cream, which made 7¾ lbs. full weight of butter, the quality of which the members will have an opportunity of judging at the annual dinner of the society this afternoon.

Very respectfully,

REUBEN HAINES.

Richard Peters, Esq.

On the Long Red Potato. By Isaac C. Jones.

Philadelphia, 1st mo. (Jan.) 19th, 1819.

Esteemed Friend,

I HEREWITH send samples of some potatoes denominated the long red, which grew on my farm the last season. Having been in the practice of cultivating them for the last three years, I have uniformly found them remarkably productive, particularly so the last season, when I obtained at the rate of at least 400 bushels to the acre, planted in furrows about two feet there to four inches apart, and the usual distance in the furrows, say ten inches. Although these potatoes in the opinion of some are very good for the table, yet I do not think them equal to the Foxites, Scotch grey's, and some others; notwithstanding, I believe them equally valuable for stock, and on account of their prodigious yield, think them well worth the attention of agriculturalists generally. Some of the samples sent when first taken from the ground last fall, weighed from two pounds to two pounds nine ounces.

With sentiments of sincere respect,

Thy friend,

ISAAC C. JONES.

Roberts Vaux,
Sec. Philad. Agric. Soc.

On the culture of Potatoes. By Isaac C. Jones.

Rockland Place, 6th Mo. (June) 19, 1820.

Gentlemen,

Any discovery made, substituting a substance in the place of barn yard or stable manure, that will operate equally well in promoting the growth of a valuable esculent for the table, at a much cheaper rate than said manure, I am of the opinion ought to be generally known, and, therefore, I have been induced to state the result of an experiment I made last year in the culture of potatoes: substituting rye straw, in the dry state, on a part of them in the place of stable manure.

The seed potatoes were first dropped or placed in the furrows, the usual distance apart, say ten to eleven inches; a moderate quantity of straw then spread immediately on them; after which, the potatoes and straw were covered with the soil, by means of the plough, in a similar manner to those planted with the stable manure, and their treatment the same during the season. The strawed and manured potatoes were both planted on the 19th of the Fifth month, (May) and on the 21st of the Tenth month, (October) following, I had the produce taken from the ground; and as the season throughout had been remarkably dry, as is well known, I was surprised to find (presuming that a wet season would have best suited the dry straw) that my straw potatoes were quite equal in quantity, quality and size, to those on which I had been liberal in the application of stable manure. The nature of the soil on which these potatoes grew, is about the medium

between a light and heavy loam. Encouraged by my success last year, I am again trying the straw on a more extended scale this season. I should like others to try it, and on different descriptions of soil.

I am, with sincere respect,

ISAAC C. JONES.

Comparative difference in the expense, between stable manure and rye straw, in the culture of one acre of potatoes, provided each were to be purchased at the Philadelphia market price, and delivered on a farm at the distance of four miles. From a calculation made, which I believe correct, it will require 200 bundles of straw of the usual average weight (say 14 lb.) per acre, which you may purchase and have delivered at 8 cents per bundle, 16 dollars. Twenty-two horse cart loads of stable manure (more frequently twenty-five are put) per acre, first cost of which and delivery at a low rate (say 3 dollars per load,) 60 dollars. Saving 44 dollars.

Philad. Society
For promoting Agriculture.

On reclaiming Marsh Land. By R. G. Johnson.

Salem, (N. J.) Feb. 10, 1819.

Sir,

Being disposed to submit my observations and experience in practical agriculture, for a period of twenty-eight years past, to the perusal of the readers of the "Memoirs of the Philadelphia Society for promoting agriculture," I shall be sufficiently gratified should any thing be gleaned from what I have written, which may tend to throw some light upon a subject connected with rural economy, and which, in some parts of our country, is but imperfectly understood: I mean the reclaiming and bringing into a dry and profitable state, the numerous wild marshes, which line our bay, river, and creeks.

The wild marshes are made from the sediment carried on them by the flowing of the tides, and deposited among the different species of wild grass which every season spring up, and in the autumn decay, and then become incorporated with the sediment of the preceding year, mixing with the various putrescent animal and vegetable substances of which the quagmire is composed. From this mass is produced a soil, which, when brought into good cultivation, continues its extraordinary fertility for many years. I have observed that on such marshes the line of distinction may be easily traced by the effects of the salt, and then brackish water upon the numerous species of aquatic plants which grow thereon. As far up the Delaware as Reedy Island, grow two species of salt grass—the rosemary salt-sedge, and the red salt-sedge, and two species of reeds; from thence, to about the

mouth of the Christiana creek, or Deep-water point, grow the three square, the two kinds of reeds, and fresh rosemary; and from thence up the river (the water being fresh) grow the bull rush, three square, only one kind of reed, wild oats, flags or cat-tails, fox-tail, spatter dock, and the water lilly. For bringing into cultivation such unproductive marshes, the universal practice throughout our county (until a few years ago) was, to dig a ditch parallel, and about six feet distant from the footing of the intended bank, and from that to make a bank of such form and size as accorded with the judgment of the owner. After the bank had stood a year or two, it became apparent that it had not only settled, but that the foundation had inclined towards the large ditch. To keep up the bank to its proper height, it was then thought necessary to dig a ditch about ten or twelve feet in the inside, and pack that on the bank; but even this method did not permanently remedy the defect. The evil of such proceedings was apparent, because the foundation could never be made sufficiently firm to support so great a quantity of mud, without settling so low as to admit the tide from overflowing the same, unless frequent additions of fresh mud from time to time were made to keep it up to its former height; and even then the expense and difficulty have been increased, in consequence of the scarcity of mud, both within and outside of the bank, and of the great pressure of mud forcing the foundation into the ditches. Another very serious evil was, that these ditches afforded an easy and safe passage for the muskrats and fidlers to enter at all parts of the bank, and thus admit the water, so as frequently to break it.

TIDE BANK.

In the present improved method of reclaiming wild marsh from the tide, the first thing to be done is, to stake

out the site for the intended bank, at such a suitable distance from the margin of the river or creek (as the case may be) as to allow a sufficient space for a guard against the swells of the water in stormy weather, and for the preparation of mud, to make and keep in repair, at a distance not nearer than four roods from said bank. Should the marsh be composed of a mat of sedges or reed-roots, (as a preparation for the intended bank) the labourers should remove, one spit deep of the roots, and lay them aside to be packed on the bank when nearly finished.

The trenches from whence the mud is to be taken, are to be served in the same manner, because such hard sods can never be sufficiently packed, but that they will admit the water. The surface being now removed, they will proceed to cut and wheel the good mud into the bed designed for the bank. To do this properly, it will be necessary that the labourers should be apportioned to the different parts of the intended bank in separate gangs, as the work will then be carried on to the best advantage, not only to themselves, but their employers. A gang is composed of five hands, two to cut and load the wheel barrows with mud, two to wheel it to the bank, and one to be there stationary as a packer. The business of a packer is to lay out the bank, pack every sod of mud that is delivered to him by the wheelers, and attend strictly to the carrying up the bank, in its true proportion and proper height; he is also to assist in making the gangways to run the wheel barrows on. As to the size of the bank, the owner must be governed entirely by circumstances; if his marsh is situated upon a water subject to freshets, which swell the tides beyond their ordinary level, or, is of a spongy or miry bottom; or, if lying on a loosing shore, or subject to be beaten on by particular stormy winds, which raise the tides; in any of these cases he must

build and fortify his bank accordingly ; but if free from those liabilities, and his marsh high and of a firm blue mud stratum, in that case, I should suppose a bank of twelve feet base by six feet in height, would be sufficient : but I would observe, that I have never seen a bank too large. Let the bank be of what size the owner may choose, I have always considered that the base should be double the width to the height, and as to the sides or slope, they should be at or about an angle of fifty degrees, and the breadth at the top of the bank about one sixth of the base. To wheel mud on a miry marsh, it is necessary the men should have boards to lay upon the mud, but in wheeling their barrows to the top of the bank (which would be an elevation of six feet,) they must have plank of not less than thirty feet long, though the longer they are the better, provided the men can handle them, and they should be not less than four inches thick. To support the plank in the middle, they should have several light posts with holes mortised in them, through which a rail or pole is temporarily inserted, so as to bear it with the weight of mud passing over, and also to prevent it from swagging; these posts will be removed, and the wheeling or gang plank, as it is called, must be removed several times before the labourers complete a single rood.

SLUICE.

The bank being finished, a suitable place must be selected for laying a sluice, which should be several rods distant from the creek or river, into which it is to discharge the water from the marsh. In the preparation for the intended bed of the sluice, the water course should be begun from the margin of the river or creek, and its depth continued at about the ordinary low water mark, until the bed of the sluice is cleared, when the digging

should be suspended until the sluice is bedded and finished. The mud on each side of the intended bed, should be removed a reasonable distance, lest, when piling for the sluice, any sudden jar might cause the sides to cave in, and thus fill up the bed. After the bed is dug, four stakes having lines fastened to them are to be drawn taught, and stuck into the mud exactly on the bottom, where the sluice is to be laid, but within the breadth of the sluice by about two inches; for example, should the sluice be four feet wide, then set down those stakes at the distance of three feet nine or ten inches apart. In the meantime some person should be in readiness with the pilings. These pilings are made from inch boards (no matter of what wood, for in the mud they never rot) sawed off, to the length of about three feet, and are to be sharpened; this is done by a person cutting and sloping away both sides of one end of the board alike, and by cutting off three or four inches of one of the corners, at an angle of about forty degrees. These pilings being set by the lines, are driven down to a level with the bottom by a maul or tip, beginning at one end and so proceeding on, until both sides are completed, and by crossing the bed in several places and immediately under the in and out end of the sluice, always remembering that the piling be put down with that edge having the point cut off furthest from the board last driven; so that in forcing it down, by the time it will be brought to a level with the one preceding, it will be drawn perfectly tight against it. Should the sluice be made of two or three funnels or divisions, you must drive as many rows of pilings as there are divisions of plank. If the mud is good where the sluice is laid, by piling in this manner, it can never settle, and no muskrat or mink, can ever undermine it. The piling lengthways and across being completed, and the lines removed, four poles eight or ten feet long, are to be set

down by the four corners of the pilings as marks to direct the workmen to the exact place into which they are to float the sluice, and excite their attention to those parts as it settles on the ebbing of the tide. When the sluice shall have grounded on the pilings, one of the workmen is to examine if it has rightly bedded, and if so, they will then proceed and cover it up with the best mud, care being now taken that a trusty packer be stationed there, to pack every spit of mud as it is delivered to him. It will now be necessary to lay two logs across and resting upon the front and in-ends of the sluice, with their ends bedded in the solid marsh, so as to prevent the mud as it is packed on the sluice from slipping out, and to prevent muskrats and other vermin from burrowing at or near its sides. It will also be necessary to have inch boards sawed to about six or eight feet in length, to be pointed and sharpened in the same manner as directed for the pilings. The labourer standing sideways to the log, with his face towards the sluice, must set the edge of the board against the sluice, and perpendicularly against the log with the cut off the corner of the board next to himself; two other men must have a two inch plank in readiness, and while one of the ends rests on the mud, the other is placed by the man attending the piling on the top of it, who are to hold it steady while the two men walk on the plank until they come over the piling, when, by raising and sinking themselves they force it down with great facility. This method is continued until these logs are piled from end to end. It must now be obvious even to a person unacquainted with such business, that if a sluice be laid and secured in this manner, nothing can injure it. For three feet under low water mark, it cannot be undermined, being, as it were, a tight board fence, and for more than half tide up, an equally impenetrable barrier against any kind of vermin.

The duration of a sluice of good materials and well laid, may reasonably be computed at thirty years. From my own observation, I am decidedly of opinion, that sluices should always be preferred to flood-gates. My objections to a flood-gate are, 1st. Because the cost is more than double that of a sluice. 2d. A flood-gate, on the average, will not last more than from ten to twelve years, while a sluice will last from twenty to thirty years. 3d. A flood-gate is frequently out of repair; from the construction of a sluice, it can seldom want any thing done to it, and when necessary, it is easily repaired. 4th Should a muskrat work a hole under the flood-gates, and they blow out, they are then good for nothing. Should a sluice blow out, we have only to make a counter dam, and relay it on the same bed, or dig another close to the one on which it before rested, and there lay it. The sluice is just as good as before the blow out. These are my reasons for giving the preference to the sluice.

DESCRIPTION OF A SLUICE.

A sluice is a trunk on an enlarged scale, for the constructing of which the usual way among farmers is to cut down a large tree, and by reducing its sides to the thickness of from ten to twelve inches, it is hoisted up, and slit through by a whip-saw, which forms the two side planks for the sluice, each being about eighteen or twenty inches broad, and in length from thirty-five to forty-five feet. These planks are then set up to the width intended for the sluice, (usually about four feet) and covered over with good two-inch plank, well secured with inch wooden pins. The door is made of two-inch plank also, and hung within these side-planks about six feet from the mouth. The method of hanging the door is, by pinning two pieces of scantling, three by five or six inches

to it, and a like piece upon the top of the sluice over the side plank, and through these four pieces of scantling to bore a two-inch hole, through which is passed a good wooden pin or iron bolt to hold the door securely, and permit it to open and shut easily. The advantage of hanging the door a little within the sluice, is, to prevent its being injured by ice, or by pieces of floating timber, and by admitting the discharge of the water more freely from it, for in leaving the sluice it glides away in a smooth current, whereas, if the door was hung at the mouth, the water would pitch down, and wear a deep hole immediately on its leaving the mouth. If it should be thought necessary to have a large sluice, say six, eight, or ten feet wide, the division plank must be increased to the number of intended funnels: thus, if there are to be three funnels, then there must be two division planks, and so on.

FLOOD-GATE.

The flood-gate is constructed of sills, ties, caps, posts, and studs, all mortised and tenanted into each other, in the same manner as any ordinary frame building, by having its bottom planked tight, and its sides boarded up with its door or doors hung to the posts, in the same manner as a common stable door. Now it must be obvious to any person, that so much wood work exposed to the alternate operation of wet and dry, must, in a few years, give way, while the sluice which has been well laid, and is never dry, will, of course, resist the effects of decay for very many years.

CREEKS AND DAMS.

It sometimes happens in large tracts of marsh about to be reclaimed, that there are creeks of considerable width and depth, with a strong tide setting through them, and

although the sluices may have been laid, and the bank completed, and that too at a very considerable expense; yet, until they be safely dammed out, nothing can be said to have been done effectually. No business in the whole circle of agricultural science, appears to me to be of more importance, than a knowledge of the mode of constructing a perfect dam of magnitude upon a mud bottom, over a deep and rapid creek of tide-water. The method which I have found to be the best, I will take the liberty of recommending to others. In the first place, I proceed with a hand or two in a boat at low tide, and carefully measure, and note down the depth of water at every eight or ten feet, until I have ascertained the exact depth from shore to shore, as well as the distance across. Then all necessary timber is provided, and worked so as to suit the different purposes for which it is designed, all such posts and other timber as may be wanted for a day's work are put on board of a large scow, or other vessel capable of the service. Having proceeded to the site intended for the dam, stakes are to be set up on both sides of the creek, the tops of which must be at least two feet above the intended summit of the bank when finished. With sheer-poles and tackle, we proceed to set down a post by lowering it into the mud, and then forcing it down to its proper depth, either by a man-hoy, as it is called, (being a large block of wood) worked by hand by the men; or if that be not convenient, by having a large log chained with one end to the top of the post, and the other end resting on the boat, and by the assistance of half a dozen men, jolting up and down on it, the post is soon driven home; another is then set down opposite the last, and when done, they are secured to each other by a large piece of timber called a cap, mortised to suit the tenons of these posts, and raised up and put on them. Thus the labour of setting, diving, and capping

those posts is continued until these two rows are completed. After that, a single row of long slim logs, (I have used many from fifty to seventy feet in length) are to be bolted to the inside of these posts, so near low water mark as that the work can be performed. And here I would observe, that all pieces of large timber used in the construction of the dam, and which cross the current, or run parallel with the dam, are called ties. All pieces of timber that cross the dam and rest on the posts, are called caps. All pieces of large timber driven into the mud, and connected by caps, are called posts. All small timber that a man can handle, such as poles, boards or plank, which are forced down by the weight of men into the mud to secure it from slipping, are called pilings. The long ties being bolted to the posts, prevent them rocking about by the rapidity of the current; and they are also the main support to the tops of the pilings which rest against them, and confine the mud to its proper place. Another set of posts, much shorter and lighter than the former, are driven midway in the space between the large posts, and pressed hard against and inside of the long ties. Opposite to these, and furthest from the long posts, other short and light posts are driven down and capped, on a range with the surface of the marsh. These outside posts are secured by a single row of long ties bolted to them; a second row of long ties are then put on the inside of the large or middle rows of posts, and directly over the in-ends of the caps of the outer posts, forming for these two middle rows of posts two complete rows of long ties, which are bolted to the large posts, and the in-rows of small posts are bolted to these long ties. Thus there will be three distinct apportions or spaces for the mud, and four separate rows of pilings to secure it within, so as to receive the body of the dam to its proper height in the middle apportion or space between the high posts,

while the two outer spaces are to be considered as supports or footings to the whole; so that by packing the hardest mud in these outer spaces against the pilings of the inner rows, it is apparent that the whole pressure of the weight of mud will be directly downward; nor can the body of mud incline either to the right or left of these middle rows of pilings, because a like quantity of mud being thrown into each of the outside spaces, will produce a like pressure upon the centre of the dam. For these pilings I would prefer two-inch plank, sawed to suit the varying depths of the water, because they are more easily pointed and more quickly driven to their proper places by three men using a plank, as prescribed in laying down the sluice. In filling up these spaces, (particularly the middle one) it will be necessary to observe that no more work is to be laid off for the day than can be secured and completed, so that it may not be swept away by the current at night. In doing this, no greater distance along these four rows of ties should be piled, than can be filled up by the hands during the day; and as preparatory to filling up the day's work, three light ties or sticks of timber, about six inches in diameter, and of length sufficient to reach across each of the three spaces, should be laid across the long ties and rested for support against the posts. Within and against these moveable ties, good plank should be stuck down close to each other, and as much mud should be thrown within, as would support them firmly to their places, and enable them to resist the impetuosity of the tide. Without these precautions the rapidity of the current would carry away the mud as fast as it was thrown in. This process, called cribbing, is necessary to be repeated at every lay-off of the work. From these cribbings, in the middle space, the mud is to be sloped backward, towards the top of the bank that had been previously finished; and be-

fore these cribbing planks can be safely removed, there must be another set of cribbing plank put down, and the four rows of long ties piled all in the same manner as the former. Thus we continue to draw up these cribbings next to the bank, and advance the new cribbings as the work progresses, until the breach be completed. To accomplish such work to the best advantage, substantial wheeling plank should be laid over the middle row of caps, for the men to run their barrows on in safety; and when it is necessary to bring their mud from a greater distance than about eighty feet, another gang way should be formed, that all the loaders (or as they are sometimes called shovel-men) may be kept constantly at work. There should be two sets of wheelers for one set of shovel-men; one set of the former to wheel up the mud half way to the dam, and there to meet the other set returning with their empty barrows. At this place they exchange their barrows; those who came up loaded, return with their empty barrows to be again filled, while the others turning about, proceed to discharge their loads in the breach. That all parts of the work might advance aright, there should also be two large flat-bottom boats, (scows) which could be very advantageously employed; the one within the dam in the creek, and the other on the outside, with hands sufficient to work them. Their business should be to bring mud from the sides of the creek, and discharge their loads into the two outer spaces, viz. the footings, by throwing the mud with force against the pilings of the two inner rows. During all the time that the labourers are employed, a few trusty men should be stationed in the mud at the dam, and should be ordered to pack every wheelbarrow load as it is delivered. Should the mud happen to be soft and incline to slip, it will then be necessary to spread over it occasionally very thin layers of fine brush, or, what is equally proper, three-square

young reeds, or any long grass. Alternate layers of such materials being incorporated with the soft mud, give it such tenacity, as that the workmen can carry up the dam to its proper height and shape. The width of such a dam would be from thirty to thirty-four feet, and the work when completed would exhibit a view, from the edge of the water at low tide to the top of the bank, a slope at or about an angle of fifty degrees. Before the work of filling up the breach is fairly entered upon, I consider it safest to guard the opposite side by running off a crib, some ten or twenty feet, and securing it by good mud packed within; for as the work advances and the width of the breach lessens, so in the same proportion, will the rapidity of the current increase. As the work advances, it would be advisable always to let the sluice doors be open to admit the tide into the marsh, and to keep up a pressure on both sides of the dam as nearly equal as possible.

DITCHES.

The marsh being perfectly enclosed, and the tide excluded, it is now necessary to have it divided into lots of such size as may be most easily put into and kept in a dry and improvable state. In whatever number of acres the owner may choose to have his lots, they should be so laid off, as that the ditches dividing them should run perpendicularly from the bank towards the centre of the marsh, and be not more than from twenty to thirty roods distance from each other in good mud; but where the mud is of a light fibrous texture, (such as is vulgarly called horse dung or peat,) the ditches should not be more than twelve roods apart. The reason I would assign for such a division is this, that in irrigating such grounds the water can pass with facility along the ditches, and spread its fertilising qualities through all parts of the meadows;

and also by such distribution, the lowest and poorest parts would receive the greatest proportion of the sediment. Another reason, I even assign, is, that the drier your meadow and better the mud, the finer and more nutritious will be the quality of the grass. It is invariably the case, that you will find the loose or peaty soil in the lowest parts of all marshes, and although it may sometimes produce a tolerable quantity of coarse herbage, or by good cultivation, a prolific crop of the improved grasses; still none of those productions will be half equal in nutrition, to that grown on good mud. In the divisions of the marsh, let all the ditches be cut eight feet wide by three feet deep; a narrower ditch would be unsafe for the cattle.

SEEDING OF MEADOWS.

As soon as possible after the marsh has been enclosed, and while the ditches are cutting, set to work in good earnest, to have your grass seed sown. It is all important to have it sown as speedily as practicable. Often have I seen the good effects of early and expeditious seeding of a new marsh, and frequently have I known that a delay for a year or two, has cost a length of time and labour, to put in the seed, and even then to very little purpose. Should the marsh have on it a great quantity of wild herbage; no matter, be not dismayed; sow among them, throw on the seed plentifully, and you will in a year or two see your account in it. If any part should remain not seeded when the winter sets in, you may burn off the rubbish (if you think best) and commence sowing your seed in February; and that it may be evenly scattered over the surface of the marsh, sow the lots twice, by crossing the first with the second sowing. The roller is always to be preferred for the purpose of beating down the rubbish, rather than destroy it by burning. It is the

practice here to sow the grass seed among the reeds, flags and wild oats, disregarding their height. I have been credibly informed a man a few miles from me, sowed timothy among a most extraordinary growth of such plants, and who, when the seeding was finished, took a common gate (not having a roller) and dragged it over the rubbish until it was flattened down; the rubbish soon rotted upon the moist surface, and afforded an abundant nutriment for the tender sets; the consequence was an extraordinary crop of grass the following year.

I would wish to be distinctly understood, that the seed should be sown on the marsh, while it is yet in its wet state, and before the frost of winter or heat of summer, should either pulverise or dry the surface; for both these natural causes operating on the surface after the seed has been sown, will do more for the embryo seed just springing into existence, than (in large bodies of marsh) hundreds, nay, I might say thousands of dollars worth of labour could effect. After the seed shall have been sown, (and from long experience I can assert) that the best and only sure way of speedily getting your meadow into grass, is to pasture it, as severely as possible, for the first and even second year. The wild herbage being kept down by the number of cattle continually feeding thereon, will afford the tender grass an opportunity to take root; while at the same time their continued treading of the soil, tends to bury the seed among the loose and decaying rubbish, and to render the surface more compact; for on that depends the growth of the artificial grasses, and the destruction at the same time of the wild plants. I consider as a truth, that the mellower a marsh is made, the less liable are grass seeds to take root, (although directly the reverse is the case in upland) or, if they should happen to take root, they might vegetate for a while;

but, when the heats and droughts come on, they will most assuredly perish.

Different marsh soils require different kinds of seed. The firm blue mud is best adapted for green grass, timothy and the clovers, particularly the white. The light spongy marsh (called horse dung or peat) is fitted for none other than the herdgrass. Immediately after the bank is completed, this kind of soil should be sown with herdgrass, while it is yet new and in its wet state, and before it has time even to exhibit dryness on the surface. While it is yet wet, a sward of herdgrass may be formed upon it, and by pasturing it closely for some time, it will then be useful for mowing for many years. I would never recommend the sowing of herdgrass on good mud, because the timothy, clovers and green grass are all far preferable, much more nutritious, and bear pasturing until quite late; on the contrary, the herdgrass is not so good for pasture, nor will it resist the effects of a late frost in the spring, nor an early one in the fall. Besides, it has a wonderful tendency to root out all the other grasses, with its innumerable long and very fine roots, and from the production of such an immense quantity of seed, which are so easily shattered out and wafted by the wind every where; that should, but a very small portion of the seed be mixed with the other grasses and sown on blue mud, it would be discovered in a very few years, that the herdgrass had obtained the complete ascendency. The herdgrass is admirably adapted for the salt marshes. It is wonderful how easily it can become the companion of even the red salt grass; and in proportion as it acquires strength and root, so in the same proportion does it take the place of that natural proprietor of the saline soil. When I speak of salt marshes, I wish to be understood, those marshes which are considerably brackish, but not so much as those bordering on the

ocean. It is asked, what method should a farmer adopt so as to render a light peaty meadow more compact? I answer, the only probable and sure way would be, to fodder his cattle throughout the winter on it: for their treading would have a tendency to consolidate the surface, and to cause a much thicker growth of young grass the following spring. It may appear incredible to those persons who are strangers to this kind of marsh, when I tell them, that a mass of such peat or horse-dung mud, as large as a hogshead or wagon body, exposed for a few weeks in summer to the sun and winds, would take fire as soon as it was applied; or, if thrown into water, would float as light as a cork; yet, extraordinary as it may appear, (if proper care be taken to get a sward of herd-grass upon it) it would astonish the beholder to view the abundant crop. The innumerable roots of the herd-grass, while they obstruct the rays of the sun, and the winds from penetrating the surface, at the same time shut in and retain the moisture for their own benefit; yet if cultivation in proper time should be neglected, this kind of marsh will finally become so very light and porous, that a man, in attempting to walk over it, would sink to the depth of his ancles. Am I asked, by what method are meadows to be continued improveable, so that they may be rendered capable of yielding considerable quantities of grass by the ordinary resources of any practical farmer, and that in the most easy and least expensive way? I answer, by IRRIGATION in three ways: 1st, Partial. 2d, Effectual. 3d, Internal.

OF PARTIAL IRRIGATION.

When meadows have been some time in bank, it is always to be presumed that a considerable portion of them have been brought into good grass, and that

even the very high parts may have become too compact, or (as it is called by the farmers) bound, to yield that productive burden which might be expected from them; wherefore, that the surface of the meadow might again be vivified, or, as it were brought to life, from that dead state in which it is commonly said to be, when bound, recourse should be had to irrigation. It is a common practice with some of our farmers to let the water on their meadows about New Year's day, and so continue it until the vegetation shews itself in the spring, and when drawn off the surface, they often have the appearance of a beautiful green wheat field. Preparatory to irrigating, the sluices should have doors hung to their in-ends, so as to admit the tide, and, by shutting down, to prevent it from running out again. There should also be a number of trunks made from two to three feet square, and a few feet longer than the width of the bank; the number of these trunks should be in proportion to the number of acres to be irrigated, say one to about thirty acres. These trunks are laid in the tide bank opposite the highest parts of the meadow, and on a level with its surface, so that every flood might pass into it from the different parts of the bank at one and the same time, through these trunks and sluices; and on every ebbing of the tide might leave its sediment incorporated with the dead and decaying vegetables of the surface, which, by its daily increasing in quantity, augments its weight upon the falling rubbish, and with it, affords the richest nutriment to the expected crop of grass. That a farmer might have the benefit of the early crop of good grass, such as timothy or green grass, which might be cut in all the month of June, and also improve the more inferior parts of his meadow by sowing grass seed on such parts as had not taken, he could, on or about the first of July, let the tide on them by the above method, and continue the process until the

first of April following. He would then find, that where the rubbish had grown in the greatest quantity, and been beaten down by various causes operating on it, there the sediment (becoming incorporated with it) had formed a new soil three or four inches in depth, completely adapted for the reception of grass seeds.

This would be the proper time for the farmer to profit by his former mistakes, (in delaying to sow his marsh when first reclaimed) by immediately drawing off the water and casting his seed with a liberal hand upon the slimy surface of this new formed stratum, composed of putrified vegetables and mud; nor let him forget as the vegetation advances, that, for insuring a good crop of valuable grass, he must have a stock of cattle, the number of which ought to be in proportion to his acres, so as to keep down the superfluous growth of the wild plants.

EFFECTUAL IRRIGATION,

Or drowning the Marsh, as it is called.

After a meadow has been many years in bank, the fine grasses almost all gone, and the surface generally covered with a coarse vegetation scarcely eatable, composed of weeds, rushes, bogs, &c., the farmer then thinks it time to let down the marsh and drown it. This method is performed by cutting away the bank opposite the ditches, and by removing the mud from off the sluices; thus, the water having a free course through all the ditches, circulates the sediment equally over all parts of the marsh. A period of from five to seven years is considered necessary to produce the desired effect. Within this time there will have formed on the surface of the marsh (on an average) a stratum of virgin mud, of from eight to twelve inches in depth. Should the marsh be

permitted to lie down for eighteen or twenty years, it will then have collected a new stratum of from twelve to twenty-eight inches in thickness. After that length of time, there cannot be perceived any additional accumulation of mud, because the flow of the common tides will be no higher than about on a level with the surface; and I think it would be a certain loss to any farmer to let his marsh continue in its wild state after it had been down for even ten years, for the accumulation of the mud would in no way compensate for the loss of the difference of time, in which profit might have been derived from it in the ordinary manner of mowing and grazing. The first time that wild marsh may have been reclaimed, has never been considered so valuable nor profitable, nor will it so readily receive or retain that system of improvement, as a meadow which had been some years previously in bank, and turned down and drowned, and a second time reclaimed and cultivated.

I must here remark, that it is in a great measure owing to practical knowledge in agricultural science, in which some of my neighbouring farmers have displayed their talents in the judicious management of their meadows, that their veal has deservedly acquired the applause of the citizens of Philadelphia; and the markets of New-York, as well as Philadelphia, will warrant me in saying, that the beef sent from Salem county has never been excelled, by that supplied from any other part of the United States, and I have the vanity to believe, that even the best farmers in England have not exceeded us.

INTERNAL IRRIGATION.

I can say but little of the salt marshes lying near the sea coast, and which had been periodically covered by the water of the ocean previously to their being reclaim-

ed. There is an opinion generally prevalent, that a certain portion of salt is beneficial to grain and grass; may not too great a quantity of it be also prejudicial? I have often used the pickle from my meat tubs, and with complete success, in the destruction of the St. John's wort, and ranstead, or snap dragon, where they have occasionally appeared on my land. And I am inclined to believe that all perfectly salt marshes, after having been in bank for several years (and when the native vegetation of the soil have died) become almost a barren waste, and when exposed to the penetrating rays of the sun, their saline particles are extracted for some inches in depth, so that distinct particles of almost pure salt may be seen on the surface. Indeed, I have seen the salt in such profusion when passing over the marsh, that my shoes would be as white as if walking in a thick hoar frost, and I cannot believe that any soil so highly impregnated with salt can be rendered profitable for a series of years in either grain or grass. As I know that some experiments are making to reclaim this highly saturated and almost useless kind of property, I will herewith submit my opinion as to the best mode of preparing this kind of real estate, whereby the owner may calculate on deriving more certain profit from it than is generally received.

So far as I have had opportunities of observing, I have generally seen springs of good fresh water issuing from the uplands and woods, and by the time they have united their numerous rills, they will have formed a creek of considerable size and depth, which in meandering through the marsh, is discharged into the larger creek or river through the sluices or flood-gates. Now nothing appears to me more rational to be done, than that the farmer should make a right application of this fresh water; which to one thus situated, I consider of the greatest importance. To freshen this reclaimed marsh,

so as to make it just brackish enough to produce all the improved kinds of grasses, he has nothing more to do than to shut down his inside doors to his sluices or flood-gates, and hold the water until it shall have raised in height, so as to cover the surface of the whole marsh: his trunks lying in the bank (as before described) will then vent all the superfluous water. Let this be done in the fall, and be continued until the following spring, then the water might be drawn off, and grain or grass sown, as suited the fancy of the owner. I have no doubt that in repeating this process for two seasons, the marsh will freshen exceedingly, and otherwise be materially improved. I would also suggest, that throughout the summer the sluices or flood-gates should be attended to, by having boards slid in them; and in the mouths of the ditches, pieces of plank should be set edgeways, so as to keep in all the ditches, a certain and continued supply for the cattle, and different kinds of grain and grass which may have been committed to the soil. The height of the water in the ditches can easily be regulated by the number of planks to be put down, the one over the other. Another great advantage to be derived from this process would be, as I have before said, that the weight of water lying for several months on this peaty and light marsh, would tend to compress and render it much more susceptible of receiving the seed to advantage when sown on it.

GRAIN IN MEADOWS.

I cannot say any thing in favour of the different kinds of grain, either from my own cultivation or that of my neighbours. I have known good crops of wheat, rye, corn and oats produced; but yet I have considered the cultivation of grain generally in meadows, as much too precarious for profitable culture. You may sometimes have

a beautiful and strong standing crop of wheat or rye on the good blue mud along the bank, or edges of the creek or guts; but it would be no more than a mere slip, with here and there a patch, compared to the residue of the marsh; all the other parts will be nothing but weeds and rubbish. I also consider it a certain waste of time, labour and money, in endeavouring to derive a profit from sowing any kind of grain on the peaty or horse-dung soil; it may vegetate for a while, and produce a shew of some straw, but very little if any grain. I admit that grain has sometimes succeeded on the good blue mud soil, but when you take into consideration that all kinds of grain are uncertain in marsh grounds, and also the hosts of enemies of different tribes which will prey upon it, such as grub-worms, mice, and birds without number; and moreover the grasshoppers and cockroaches which attack the grain after it has been reaped, and while in shock, you may readily conclude, that the risk of the destruction would be much more probable than a fair calculation for profit.

My judgment, therefore, is, (calculating for a series of years, say six or seven) that the loss would by far overbalance the profit. In my agricultural pursuits in early life, I was led to believe that the marsh was the very quintescence of nutriment for all plants, and that all kinds of grain might be cultivated there in great perfection. I tried different kinds of grain, and succeeded in causing them to grow, but I remember, not to my satisfaction. I have long been satisfied in my own mind, that the upland was by nature intended for the production both of grain and grass, but that the marshes were designed for grasses only. There can be nothing more true in agricultural science (according to my estimation) than that a plough should never enter a marsh soil; we may be assured that the best side of any marsh is uppermost.

I have herein endeavoured to give you my practical observations and opinions in answer to a part of the twelfth inquiry, as stated in the 4th vol. p. 307, of the Memoirs of "The Philadelphia Society for promoting agriculture." Should any thing I have written, be considered of utility in aiding the advancement of agricultural science, it is entirely at your service.

I am, with great respect, &c.

ROBERT G. JOHNSON.

Richard Peters, Esq.

Remarks on Mr. Johnson's Paper. By J. R. Coates.

May 18*th*, 1819.

Dear Sir,

THE communication of Robert G. Johnson, Esq. respecting salt marshes is now returned to you. Many of the observations are similar to those on the same subject in the 4th vol. of Memoirs, and therefore serve to corroborate facts and opinions. Many new opinions are stated by your correspondent tending to inform the beginner and improve the experienced. The remarks headed "tide bank," "sluice," "description of a sluice," "flood-gate," "creeks and dams," and "ditches," are very instructive to persons who have had some practical acquaintance with these water works, though to others they may be unintelligible. With respect to "the seeding of meadows," and "irrigation," Mr. Johnson has given some new and useful ideas; and it is only on the head of "grain in meadows," that I would hesitate to adopt all his opinions; for though the general observation be correct, "that the best side of any marsh is uppermost," there are exceptions; and to adopt that opinion as universally applicable, would be to lessen the value of many large tracts of marsh. Sandy lands, contiguous to immense marshes, may be so cheaply supplied with salt grass, as to keep down the price of the fresh; and if the adjacent lands be too poor for the growth of grain, it is desirable to convert the natural meadow or marsh into arable land. Mr. J., judging from his experience, which he says is confined to brackish marsh, seems to be of opinion, that grain cannot be made to grow except on the margin of creeks; at least, that a very inconsiderable portion of meadow will be covered with a uniform crop. I have known that partial appearance he speaks of, but

also have seen as much as 200 acres in a body, and that not of the most solid nature, clothed with a fine crop of rye; the straw was strong and the heads large and well filled.

I am ready to attest the correctness of Mr. Johnson's view as a general one, and indeed that it is more applicable to meadows than to upland. I would even admit that in any situation of high or low, interior, or sea shore, where there is a sufficiency of grain for the support of the inhabitants, and no extraordinary foreign demand that would raise the price of it, the system of laying grounds into grass is preferable.

Your valuable correspondent is "satisfied that the upland was by nature intended for the production of both grass and grain, but that the marshes were designed for the grasses only." The observation may be correct with regard to most situations, but too extensive in its bearing; for there are districts of upland too sterile for grain or grass, and yet there appears no reason from that circumstance, to imagine that providence intended marsh alone for the production of them. It is to the unqualified opinion of Mr. Johnson that I object, while I take the occasion to express the satisfaction you have afforded me by lending his letter, and in the opportunity of improvement from reading the remarks of so intelligent and experienced a gentleman.

Very respectfully, your friend, &c.

JOHN R. COATES.

Hon. Judge Peters.

[See the valuable communications of Mr. Coates and Mr. Swartwout, in our 4th volume. I very much approve of Mr. Coates's general observations, in the foregoing letter. I do not profess to be acquainted with *salt* or *brackish* marshes; and whilst I express my high estimation of Mr. Johnson's communication, I must say, that some marshes are exceptions

to his general remarks. With fresh tide-water marshes, I have been familiar through my life, though I have had no extensive concern in them. A piece of marsh on the Schuylkill has been in my family, I believe, sixty years, and I now own it. I remember well its being first cleared and cultivated; I have known as fine Indian corn, rye, barley, and wheat, raised on this marsh as any upland ever produced. But the latter grain is not eligible, because subject to blights and mildews, and too luxuriant straw, in such grounds. The soil consists of alluvial deposits; tenacious in its texture, and sound to a great depth. The blue mud, which is a mixture of aluminous earth, a small proportion of sand, some ferruginous particles, and decayed vegetable matter, for the most part composes it. It has been repeatedly ploughed to great advantage, and cropped with grain; but it has generally been kept in grass. It has been often overflowed without durable injury. Similar culture and treatment have been used in a great body of the like marshes, composing an extensive district, whereof this is a part. The great desideratum is, to keep such marshes completely drained; and a land drain, (*i. e.* one next the fast land,) should never be omitted. In the hands of careless tenants, or indolent owners, tussocks abound; these should never be suffered to remain. A strong paring or tussock plough will save manual labour (which is very expensive) in their removal. I have known the tussocks, generally prevailing over the neglected surface, thus removed, and, when dry, burnt; no farther operation of the plough was then necessary. Crops of grain were harrowed in, and were very productive. These marshes, in dry seasons, have a tendency to bind, and crack in multitudinous fissures. Irrigation, by overflowing them, is then highly beneficial. Timothy is the best adapted to these marshes, when first taken up for culture; but the green grass, (*poa viridis*) is the general cover, and a most valuable grass. Hemp grows luxuriantly on fresh marshes. R. P.

May, 1825.]

On the Sulphuret of Lime as a Manure. By Dr. Isaac Chapman, of Bucks County, (Penn.)

Wrightstown, (B. C.) Dec. 29th, 1818.

Some years ago I made some experiments with sulphuret of barytes as a manure, which had very great effect in promoting vegetation, and likewise preventing insects from injuring vegetables, some of which experiments are published in the Memoirs of "The Philadelphia Society for promoting agriculture," vol. III. p. 120, and subsequent experiments have fully confirmed what is there stated.

In the year 1817, several species of insects in the catterpillar state, did great injury to the young plants of Indian corn, destroying whole fields, and I apprehended their return in 1818. With the intention of preventing the evil, and in the expectation that sulphuret of lime would act as a manure in the same manner as sulphuret of barytes, I procured a quantity of sulphur and lime, prepared my sulphuret, and when planting corn, had about one-third of a table spoonful scattered on the grains of corn in each hill, before they were covered. The young plants made their appearance above ground about the same time as in those rows not sulphuretted, several being left in that state, but the difference soon became apparent, and continued throughout the season; and when the corn was gathered, from viewing the different rows, it was supposed those sulphuretted would yield near one-third more than those not so treated.

To determine the point I had a number of the rows of the corn that were sulphuretted, and those not thus treated, measured, and, to be more accurate, I weighed

the corn that grew on each row, the result was as follows :

One row, sulphuretted, gave - -	157 lbs.
One row, not sulphuretted, next adjoining the other, - - - -	117
Gain,	40 lbs.
One shorter row on a looser soil, sulphuretted,	95 lbs.
One adjoining, not sulphuretted, -	69¾
Gain,	25¼ lbs.
One adjoining, sulphuretted, - -	96 lbs.
One near the same, not sulphuretted,	71
Gain,	25 lbs.
In this field were 81 long rows, gain on each row, 40 lbs. - -	3240 lbs.
38 short rows, gain on each, 25 lbs.	950
Gained on the field,	4190 lbs.

91 lbs. of ears give one bushel of shelled corn, and 4190 lbs. will give 46 bushels gained on a small field, which produced, by a supposition of the quantity in each wagon load, 172 bushels, and which, without the sulphuret, would have been 126 bushels. The greater part of the soil of this field was a heavy white clay, broke up the autumn preceding, and, what is singular and unexpected, the sulphuret had the greatest effect on the stiffest clay. I think the cost of sulphuretting this field did not exceed two dollars in the price of materials and labour.

Here was a gain of 4190 lbs. of shelled corn from the application of about 150 lbs. of the composition; and if we take into account the weight of the stalk and cob, we may add as much more, which will make more than four tons, or 8380 lbs. This opens a wide field for speculation, but my object being to state facts, I shall leave reasoning thereon until it can be done with more precision than at present.

The sulphuret was applied on part of another field, of a much looser soil and more suitable for corn; but the effect, though very visible, was not so great as on the other, and it was gathered before I concluded to measure any of it. As for the effect of the sulphuret on insects, nothing certain can be said, as they made but little appearance this season, and further experiments are required to determine the point.

I applied some of the sulphuret on corn after harrowing, but it had not so much effect; as the weather was dry and hot for some time after, I apprehend the strength of the sulphuret was evaporated, for, on walking over the ground, a strong smell of sulphur was perceptible for many days; which seems to prove that the compound should be mixed with the soil as soon as applied.

It is known that different soils require different kinds of manure, or, to speak more accurately, the application of substances of a different nature and action, to one kind of soil, will produce great fertility; when, if applied to another, will have no effect, and on some will be injurious. In this respect, our farming is most defective, and thousands of dollars are annually thrown away. In the application of most kinds of manures we want more experiments accurately made in the field; and although a single experiment may appear to be of little consequence in itself, yet, when combined with others, it may form a link in a chain of experiments of great importance.

I prepared my sulphuret in the following manner: I took, in the proportion of 100 pounds of lime and 20 of sulphur, grossly powdered and mixed them well together in a large vessel, sprinkling the compound, as put in, with water; sufficient heat was produced to form the sulphuret; the composition is soluble in water, whereas the lime is very sparingly soluble, and the sulphur not at all.

Roberts Vaux,
Sec'y. Philad. Agric. Soc.

On the Bloody Murrain.

In the year 1819, the Society having been informed by the late *John Cox*, of New Garden, Chester County, that the Bloody Murrain prevailed to a considerable extent in that county, it was resolved to publish a request to farmers to communicate the result of their observations on the symptoms, progress, and treatment of the disease. This was done, and the following letters were in consequence sent to the Society:

Respected Friend,

Some time late in the autumn a drove from the state of Ohio, passed through this district, out of which many persons as usual supplied themselves with their stock of steers for fatting. Shortly after, I heard that the bloody murrain had appeared among the cattle in my neighbourhood, and that some had died. Of the purchasers above mentioned, John Bailey lost five; Jesse Underwood, two; Mrs. Way and another person, one each; they all live within a short distance of London Grove Meeting House. I this day called on John Bailey, the principal sufferer, and received from him the following detail: Of the five beasts which he lost, three were of the drove cattle and died first, the other two were a large working ox, and a smaller steer; three died of the bloody murrain, and two of the dry murrain; those affected with bloody murrain, discharged it by urine and stool in such abundance that they died in little more than twelve hours after its first appearance as a decided complaint, having drooped and rejected food for some time before. Nothing appeared on those who died of the dry murrain but hardness of the dung, a difficulty, and, at length, a disability to discharge

it, with the same drooping and rejection of food. He drenched them with Glauber's salts, which operated on most, and with turpentine diluted, but with no good effect—all that sickened perished. On opening them he found the manifolds stuffed with fœcal matter as dry as if found in the summer in a field; the downward passage closed up, except in one or two cases, in which it was open about the length and diameter of the middle finger. Anxiety to get the carcasses under ground prevented more minute examination. The remaining four which died at other places within his knowledge, had all, as he assured me, the bloody murrain. He mentioned a case of bloody murrain at his brother-in-law's, near West Chester, before the arrival of that drove; on the whole, I believe there is little doubt that the Ohio cattle introduced it here; that it is now providentially extinct; and that its effects in this district were confined to the cases I have mentioned.

I remain with respect, thy friend,

HENRY COX.

London Grove, 4th mo. 2d. 1819.

Richard Wistar, jr.
Sec'ry Philadelphia Society
for promoting Agriculture.

Spread Eagle, Chester Co. 22d March, 1819.

Sir,

ABOUT the middle of October last, I purchased a pair of remarkably fine cattle, which were bred in the northern part of the state of Ohio, about 80 miles distant from Pittsburgh. The cattle rapidly improved in flesh, being fed on good timothy hay, and sometimes, but rarely, on well-cured corn fodder. Early in the month of February, during a moist state of the atmosphere, one

of the aforesaid cattle was reported to be diseased. I immediately discovered that he laboured under some fever, and exhibited great dejection of spirits and countenance; this indicated the propriety of blood letting, but before the arrangements for this operation were made, I discovered that the steer was afflicted with a severe bowel complaint, as he copiously discharged blood partially intermixed with his dung. I therefore concluded that the use of the lancet would not be advisable, and substituted half a pound of Glauber's salts. It was now about 4 o'clock, P. M. and not supposing that the unknown complaint was so speedily to terminate his existence, I did not visit him again until twilight of the next morning, when to my great astonishment I discovered him to be in the agonies of death.

To prevent contagion, he was, immediately after life left him, conveyed to a proper distance from the other stock, and opened. No parts of the abdominal contents exhibited signs of disease, excepting two. The gall-bladder was surprisingly distended, the vegetable substance contained between the manifolds was unusually dry, and the manifolds retained little more tenacity than that of macerated paste-board. Never did I so much regret the loss of a working beast as on this occasion; his remaining companion, from his lamentations, seemed to know that the faithful sharer of his toils had disappeared for ever.

I resolved to procure a mate for my surviving ox, and instantly repaired to the farm of a neighbour, who, I knew, had selected some fine oxen out of the same drove; and here it was, that I was first informed that the bloody murrain had recently made its appearance in several parts of this county; and that he, my neighbour, had lost two excellent cattle by this disease, they being out of the same drove from which I had procured my yoke. It is

scarcely necessary to add, that under these circumstances, I declined the purchase of a mate. So far from adding to my stock, my attention was turned towards the preservation of the remainder of my cattle.

The lingering indisposition of one of my neighbour's cattle enabled him more distinctly to mark the progress of the disease. This steer, like mine, appeared languid, refused fodder, discharged blood by the urinary passage,* and some through the bowels, mixed with common dung. A member of the family, the gentleman himself not being then at home, stated that the steer first diseased was bled, immediately on the discovery of indisposition, and that he almost instantly expired. Glauber's salts, nitre, cream of tartar, and drenches of black snake-root, were administered to the other, but he fell a victim to the disease.

By my informant, I was recommended to a farmer who had some experience in the nature of the complaint, if really the bloody murrain. I was so fortunate as to meet with this gentleman, who said that in the autumn of 1817, several of his cattle were attacked by a complaint which he presumed to be the bloody murrain; that after losing two steers, he succeeded in saving the life of a third, which had been most certainly seized with a complaint similar to that of the deceased steers; that each exhibited signs of great dejection, loss of appetite, debility of limbs, &c.; that each discharged blood through the urinary passage, but little or none through the bowels. The regimen and medicine which he supposes saved the life of the third subject, were as follow:

After preparing a comfortable stable for his steer, he administered a strong drench of black snake-root tea;

* This circumstance I did not discover as an attendant on the complaint which afflicted my steer; nor do I recollect of his attempting to discharge water.

and after the lapse of eight hours, gave him the following dose—

One pound of Glauber's salts,
One ounce each of nitre and cream of tartar,
Two ounces of powder of ginger,
Four table spoonsful of molasses.

On these ingredients were poured three half pints of boiling water, and, when milk warm, the whole was given in one dose. This he repeated twice, observing intervals of twenty-four or forty hours. In the course of two days there were evident signs of convalescence. The steer was housed during the above treatment, and prohibited cold water; his messes consisted of scalded wheat bran, sometimes freely diluted with black snake-root tea.

I very much regret that I can afford no further information on this very interesting subject of inquiry. It is now six weeks since the death of my steer; no symptoms of complaint similar to his have as yet appeared among my cattle. As I know of no preventive, of course I could apply none; but I watch the approach of the foe, and am amply supplied with the above remedies, if, unfortunately, I should be compelled to resort to their use.

With great respect, yours, &c.

I. Wayne.

Richard Wistar, jr.
Sec. Philad. Agric. Soc.

New Garden Township, Chester co.
March 30th, 1819.

Sir,

In the year 1816, I had a cow 7 years old, with a calf about eighteen days old, both in fine order; in the evening, when the cattle were brought up to be milked, my boy told me that this cow dunged blood. I exam-

'ined her dung, and found it covered with a coat of blood; the cow did not look well, but, apprehending no danger, she passed till next morning, when she appeared blind, and died about ten o'clock; and, upon examination, she had that night voided about one pint of dark coloured blood.

Last fall I had a cow about eleven years old, and in fine order, giving milk, taken in the same way; she died in about the same length of time, from the first time I discovered her ailing. My boy, when he had seen her, told me her horns were hollow; I immediately examined them and found they were so, and that an inflammation had taken place in the brain and the root of the horn; for about one inch was coated on the inside with a slimy matter. In the beginning of last February, when treading out clover-seed with two yoke of oxen and two horses, I discovered one large ox six years old, and in fine order, voiding dung similar to the two cows above mentioned; on examining him, his eyes looked heavy and blue. I immediately turned out, (this was about ten o'clock, A. M.) took the cattle to water, but the sick one would not drink; I put him in the stable, but he refused to eat. I felt his horns and they were warm, somewhat warmer than the others; as he appeared to be going like the rest, I bored his horns about two inches from the head; they were dry and hollow, and so soon as he was released, he began to eat, and I plainly could see a change in his eyes. I then gave him three balls made of rye flour, each containing one table spoonful of the flour of brimstone, and six cloves of garden garlic. I arose in the night to see how he was, found him lying chewing his cud, and in the morning I found in his stable about one pint of dark coloured blood; by keeping the holes in the horns open, without any other attendance, he was able to work in three weeks, and, by his appearance, would have been fit

for labour sooner. I forgot to remark, that the same kind of slimy matter oozed out of his horns, as I saw in the horns of the last cow that died, and I have every reason to believe that he would not have lived till morning if I had not bored his horns. As to the flour of sulphur and garlic, I know not whether they did any good, but being harmless in small quantities, I have always recommended them, and have never known this method to fail when taken in time. From all the information I can collect, the cattle that died with the disorder called the bloody murrain, were affected in the same way, and this method of treating them has succeeded in all cases since it was discovered. As to prevention, I know of none; but intend to try an experiment by slitting the tails of my cattle through the centre of the bone, about six inches up from the lower end, and keeping the two separate until they heal; then they will have a brush and a forked tail. Some time ago a gentleman from the southward informed me, that he had been told that in some parts of Europe they cut off their cattles' tails, about six inches from the end, to prevent them from having the hollow horn, but objected to it, as it took away their brush, which, in his neighbourhood, was necessary for the health of the cattle in summer to drive away the flies. My plan, if it answer the purpose, I believe will remove the objection.

I remain yours, with esteem,

JACOB JONES.

Richard Wistar, jun.

Downingtown, 4th mo. (April) 11*th*, 1819.

WE had one heifer that was ill three days; I gave her salts, [supposed Glauber's] but to no effect, and the disease proved fatal. About eight or ten days afterwards, a

cow was taken in a similar manner. We now resolved to try another experiment; we took from four to five grains of opium, shaved it in water, and mixed a little camphor with it; she was then not able to get up when down, but in the course of one night she was raised again. I believe it to be a disease similar to the dysentery in the human body.

JOSEPH KERSEY.

[As many losses were sustained in the year 1819 from the disease above mentioned, it is much to be regretted that the Society was not favoured with more communications. Every fact respecting the diseases of domestic cattle is important; and the Society will always be pleased to receive them. The disease which prevailed in Chester county may have been introduced by the Ohio drove of cattle arriving in 1819; yet, from the facts in the letters of Mr. Cox and Mr. Jones, there can be no doubt of its existence in the county before that year. The truth is that it sometimes appears as an epidemic, and that cattle in some parts of the United States are particularly disposed to it, particularly in South Carolina and certain districts of Virginia. From the valuable letter of Mr. Harrison, it would seem that a certain remedy is at last discovered, for this hitherto fatal disease.]

Berkeley, (Charles City Co. Vir.) Jan. 21*st*, 1825.

Dear Sir,

YOUR favour of the 8th inst. (requesting information from me on the subject of the distemper of cattle, or what is generally known as the bloody murrain,) was received by the last mail; and I take great pleasure in answering your inquiries as fully as my own observation will enable me to do.

The first symptom of the disease generally noticed is, an entire loss of appetite on the part of the animal, attended with considerable fever; this is followed by slight discharges of blood whenever an effort is made to stale. In this state, great restlessness and weariness is discovered; in a later stage there is no discharge whatever from the bowels, and until the means of relief were discovered, inevitable death soon ensued.

The first effort I ever made to arrest the progress of this dreadful scourge, which annually deprived us of a considerable portion of our cattle, was by blood-letting; a remedy which often proved beneficial, but was frequently ineffectual.

Mr. Jones of Glocester, advised me to use a drench of the infusion of cedar berries, and the remedy was adopted from a full conviction that it was infinitely better than any other which I had previously tried.

The drench given was generally about a quart of the infusion contained in a bottle, in which was probably half a pint of the berries. In nearly every case the effect was almost instantaneous; a considerable discharge from the bladder and bowels followed, and in five or ten minutes time a disposition to eat was shewn on the part of the animal. I verily believe, sir, that in nineteen cases out of twenty, where this remedy has been fairly tried, a perfect cure has been effected; and where it has failed, I have imputed it to improper management, to violence to the animal in giving the drench, to an improper preparation of the drench, or the disease having continued until relief was impossible. In many cases the drench was repeated four or five times, as it was believed that any effect it might produce would be beneficial.

In regard to this matter, however effectual the remedy might be when applied, yet there was another consideration of much importance which rendered it less valuable

than might be supposed. Frequently our cattle were found dead in their pastures, without our having an apprehension of their being sick. It has now been several years since even this cause of uneasiness with me has been removed. About four years ago, Mr. Wm. Minge, of James River, informed me of what (I believe) is an effectual preventive of distemper in cattle, inasmuch as I have never lost any of that stock since its application: this is a kind of lick to which the cattle have free access. The one which I use is a large trough, into which is put a considerable quantity of clay, and then a mixture of salt (in the usual proportion for stock) together with tar and pulverised brimstone; the salt, tar, and brimstone are renewed as often as appears necessary, to give a strong flavour to the mixture. For fifty cattle, during the season in which they are liable to distemper, I use about one gallon of tar and half a pound of brimstone per week. I believe this to be an effectual preventive of distemper, and where the disease exists, feel well assured that it will prevent its increase.

With regard to your inquiry, Whether it is considered peculiar to South Carolina? I have to answer, that it is certainly endemic in Virginia, particularly in the counties bordering tide-water, that it generally originates with ourselves, but is readily communicated by distempered cattle, unless a preventive be used; but without precaution, we know not the day or hour when it will make its appearance.

I am, sir, yours, &c.

BENJ. HARRISON.

Dr. James Mease.
V. Pres. Philad. Agric. Soc.

T

On Salt as a Manure. By Charles Peirce.

Germantown, Nov. 12th, 1819.

My dear sir,

I HAVE perused, with pleasure and profit, the interesting pamphlet which you were pleased to put into my hands a few days since, containing "A letter to the farmers and graziers of Great Britain, on the use of SALT in the various branches of agriculture, and in feeding all kinds of farming stock, &c., by Samuel Parkes." Many of the observations, together with the recitals of his experiments, I am satisfied, from my own experience, are correct, inasmuch as they are founded upon the same principle in the improvements of agriculture, which I have pursued for several years. In the course of the last year I made some new experiments with salt, not only as a manure, but also to try its effects upon a lot of ground which had the preceding years been so overrun and infested with those destructive vermin the ground-mice and grub-worm, that my corn plants, when young, were cut up, forcing me to plant them a second, and even a third time; and in the fall, when taking up my potatoes, beets, and parsnips, I found them to be nearly half devoured, but I have had the happiness to find that the salt so completely annihilated them, that not one of either kind has since been discovered in or about the lot since it was strewed thereon. The quantity which I used, was about at the rate of four bushels to the acre. It was strewed over the ground in the month of March, and laid upon the surface of the earth a week or ten days previous to its being ploughed and harrowed. In the month of

April, I planted about one-third of this plat with Indian corn, one-third with potatoes, and the other third with beans, peas, cabbages, onions, and a variety of tap-roots, all of which succeeded remarkably well, considering the unfavourable season as respected rain. My corn exceeded, perhaps, any other in the township.

I coincide fully with Mr. Parkes in the opinion, that a great portion of the land in our country, might, by the the proper use of salt, be made to produce nearly double the amount it now does, besides bringing our crops to maturity much sooner, which would be a matter of vast importance, particularly in our middle, northern, and eastern States, in which the early frosts are very apt to do much mischief.

I also think highly of the opinion of the celebrated Dr. Darwin on salt as a manure, his sentiments upon this subject being both natural and philosophical; he observes, that "as it is a stimulus which excites the vegetable absorbent vessels into a greater action than usual, it may, in a certain quantity, increase their growth by enabling them to take up more nourishment in a given time, and perform their circulations and secretions with greater energy." I have no doubt, but salt would prove an excellent manure for grass lands; but that the quantity proposed by Mr. Parkes would be far too much for any soil in our middle States, unless on very hard clay. From past experience and observations, I will venture to say, that six bushels per acre would prove an abundant dressing for most of the grass lands in this part of the country, and the good effects of this, or even a smaller quantity, on our common pasture lands, would be seen for several succeeding years. The grass of meadow lands would be greatly sweetened and improved with only two or three bushels per acre, so

that grazing cattle would feed and fatten thereon with avidity.

"The safest way for a farmer, (says Mr. Parkes) is to proceed to use his salt sparingly at first, and in all cases to leave a small portion of the same land without salt, so that the real effects produced by the salt may be, by comparison, in every instance, self-evident and palpable."

Salt also mixed with common barn-manure, will greatly sweeten the grass, and make it shoot and grow much faster than any other manure whatever. In making compost, if a bushel of salt was strewed between every foot layer, it would create fermentation, and add double strength and treble value thereto, as a manure for any kind of soil. So, in like manner, if the farmer would haul a quantity of sand, loam, earth from ditches, or mud from creeks or brooks into his barn yard, and mix it well up with the manure, and throw on half a bushel of salt to every load, it would ferment, invigorate, strengthen, and thereby enhance the richness and value of his manure, and it would be the cheapest way of dressing land that could possibly be devised. Cattle fed only upon light dry straw and corn fodder, without any thing else for their sustenance, will yield but a poor and light manure, very little better than loam itself, unless it be well salted. Whilst cows and oxen feeding on good hay, assisted by a mess of corn two or three times a week, and a gill of salt to each creature every third morning, will produce manure of the best kind, and, by adding half a bushel of salt to every wagon load before or after hauling it into the field, it would richly manure a third more land, besides destroying all kind of grubs, moles, and other vermin with which the ground may be infested.

I have not the smallest doubt remaining upon my mind, but, that the mixing of salt with ashes, lime, or plaister, it would increase the fertilising qualities of each

nearly double, and that this kind of manure would be congenial with any soil. Salt and ashes applied to a stiff, clayey soil, will destroy all its adhesive qualities, and render it as easy of cultivation, and as productive as the richest loam.

I now, sir, shall conclude these remarks in the strong and appropriate language of the excellent Hollinshead.

"AGRICULTURE," says he, "is the most certain source of domestic riches. Where it is neglected, whatever wealth may be imported from abroad, poverty and misery will abound at home. Such is, and ever will be, the fluctuating state of trade and manufactures, that thousands of people may be in full employment to day, and in beggary to-morrow. But this can never happen to those who cultivate the ground. They can eat the fruits of their own labour, and can always, by industry, obtain at least the necessaries of life."

I am, sir, yours, &c.

CHARLES PEIRCE.

Mr. Mathew Carey.

[I have long been convinced, both from experience and reading, that salt is a most valuable manure. It requires, however, attentive practice to know the quantity proper for an acre, and the kind of soil with which it is most congenial. In a note, (page 177, of our 2d volume) I gave an unfavourable account of my experiments with *salt.* But since the receipt of Mr. Parke's pamphlet, which, at my request, was published by Mr. Carey, and an extensive distribution of it made by the Society, I have had every satisfactory reason to alter my opinion. My rule has ever been, never to abandon an experiment because a few failures occur. I have frequently profited by perseverance. I have repeatedly spread salt on grass grounds in a variety of modes and quantities, and often on winter grain. Most wonderful effects have sometimes appeared, and often none at all. I cannot yet arrive at the exact quantity required. I have had strips of grass

lands marked out, and measured quantities of *salt* strewed; sometimes the least quantity produced the greatest effect. My mowers, when they arrived at some of the salted strips, would exclaim, "here comes the salt!" And when the field was finished, the salted strips could be perceived at any reasonable distance, by their deep verdure. The English books are inadequate guides, as they only shew the quantities of foul salt used. I relate the following experiment, not for the eligibility of the rotation, but as a trial of the efficacy of salt. Four years ago I strewed *thirteen* bushels of pure coarse salt on an acre and twenty-seven perches of ground, in the fall, and ploughed it in. The next spring I planted potatoes, lightly dunged, in the usual way. I had a miserable crop; but it was clean and free from weeds. After gathering the potatoes, I sowed *wheat*, well furrowed. On the grain I sowed clover and orchard grass. My wheat at harvest was scarcely worth reaping, and the grass looked very unpromising; but, to my utter surprise, as the next spring advanced, a most luxuriant crop of *clover* appeared, which grew so high and strong, that I cut more than four tons: it was coarse and not relished by my cattle; much had been layed. In the fall, I ploughed it in, and the last spring I again planted *potatoes*. I gathered one of the most plentiful crops I had ever experienced. After the potatoes, I sowed rye, which now promises an abundant crop. I manured, in every instance, very slightly, with dung of an inferior quality. I have given this detail to shew, that an over quantity of salt is temporarily injurious, but ultimately salutary and effective. When, therefore, I perceive objections to salting, (as I often do, as well here as in England) I am satisfied that there has been error, either in the quantity or quality of the *salt*, in the nature of the soil, or the mode of application. On grass grounds I have known an intermission of effect during one or two years, and thereafter a luxuriant produce; no doubt owing to the improper quantity used. My farms are chiefly composed of a kindly loam, well adapted to every species of manure. I have clay fields, but I do not recollect any experiments with *salt* on such fields. R. P.

May, 1825.]

On a new Corn Planter. By John Conard.

Lampeter township, Lancaster Co. (Penn.)
11th mo. (Nov.) 8th, 1819.

Sir,

HAVING invented and brought into use a machine called a Cornplanter, for the purpose of planting Indian corn, which has been found by the experience of my neighbours and myself for two years past, to be extremely useful in facilitating the planting of corn in an improved manner, I herewith forward a model (not made to scale) for the use of members of the Society and others, who may choose to have them constructed; not desiring any further remuneration for my invention than the satisfaction arising from agriculturists generally having the liberty of constructing and using it free of any expense for the privilege. The description is as follows: viz.

The sled is made of 2½ inch plank, five feet long and one foot deep; the runners placed two feet apart in the clear; the cutter before, which is for dividing a sod or any hard substance, should sink 3½ inches below the bottom of the runners; the opener or furrow maker is 3 inches wide and sinks two inches below the bottom of the runners; the shoe, out of which the grain issues, should be somewhat shorter than the opener, and the aperture in it about an inch in diameter; the two pins or harrow teeth behind to sink one inch below the bottom of the runners; the clearing block, which will break the clods and level the ground, is made of plank, and may be one foot in length on each side, and should be fixed so loose as to accommodate itself in some measure to ob-

structions—this is to move on the same plain with the bottom of the runners; the wheel, two feet in diameter, and the pins four inches long, making the whole diameter two feet eight inches; the cylinder under the hopper should be three and a half or four inches long, and four inches in diameter, having four notches to receive four or five grains each, the notches to be constructed after the form of the model; the cylinder should have iron gudgeons, neatly turned, to run in metal; the hopper twenty inches long, and ten inches deep.

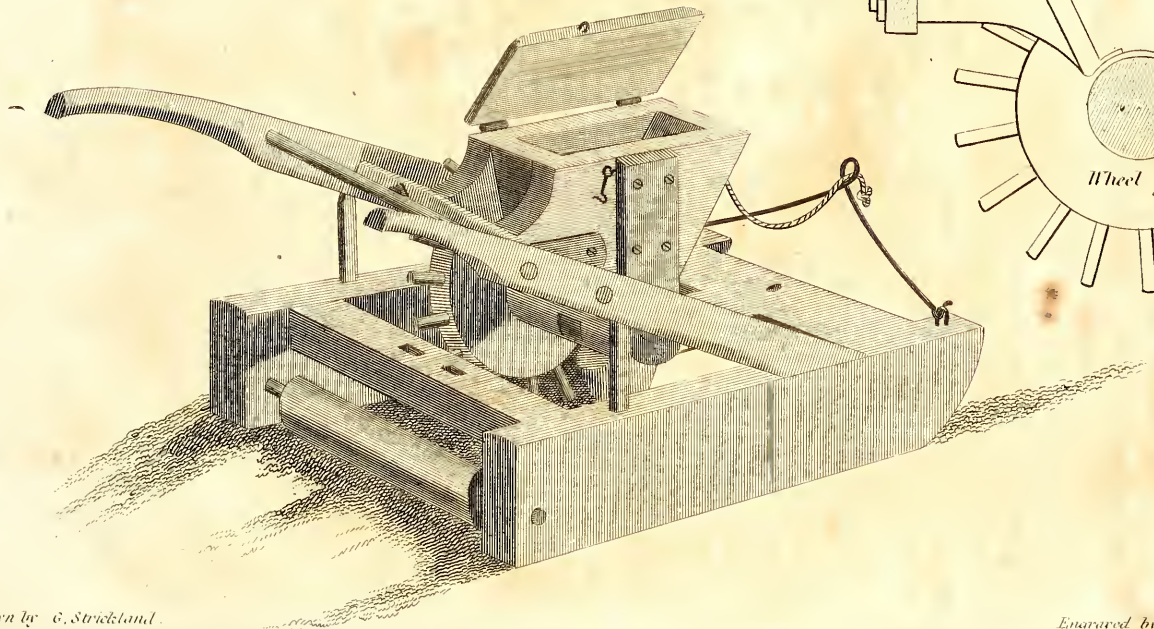
It is to be understood, that previous to the machine being used, the ground should be ploughed and harrowed as usual, but not furrowed out, the machine performing the whole business of furrowing, planting, covering and levelling at the same time, and with quite as much rapidity as the ground is furrowed out in the common way. Ten acres have been planted in one day by my machine, without any previous furrowing. The advantages of its use are, that the corn is regularly planted at equal distances, without any previous laying out of the ground; it is all covered of an equal depth and with fine mould, the clods being pushed out of the way, and the fine earth passing the sides of the furrower falling on it. It is believed that more corn has been raised in proportion on a given quantity of ground, by its being thus regularly planted and evenly covered. There is a strap or rope to draw up the hopper and prevent the grain passing out, when turning at the head landing. The machine being on runners, it is more steady in its movements and more manageable than if it were on wheels.

ISAAC CONARD.

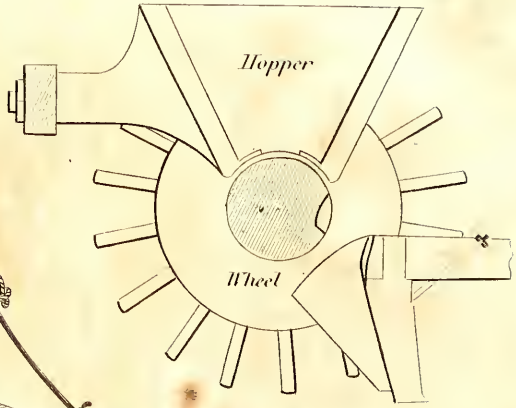
Roberts Vaux,
Sec'y. Philad. Agric. Soc.

Plate 1

Conard's Corn Drill.



Detail of Hopper &c.



Drawn by C. Strickland.

Engraved by J. Yeager.

2d mo. (February) 12*th*, 1823.

"I HAVE added a roller behind, to press the soil on the seed, as I find that by so doing, the corn vegetates more vigorously, and is not so liable to be destroyed by the common cut worm. This insect being a feeble digger, and unable to penetrate near the plant, crawls to places where the soil is loose, and there making a bed, there are ten chances to one of its finding the plant again, and if so fortunate, it cuts off the plant above the surface, which does not prevent a second growth. Perhaps it may be thought that the machine cuts too much of the seed corn; but this defect will cease as soon as the sharp edges of the plate wear off by use. The quantity of corn thus lost, is moreover of trifling value. The machine is made to plant 2½ inches deep. It may be of advantage to arm the runner with a thin iron sole, to prevent the corn from being deposited at a greater depth; for the depth will be in proportion to the substance worn off from the runners. If there should be much loose sod, or any rubbish on the surface of the ground, it is probable the two levelling pins will drag it and uncover some of the seeds; if they do so, they must be driven up. Rough ground, also, requires the pins to be shallower than ground in fine tilth. If necessary, the roller may be shod with iron to increase its power in pressing the soil on the seed. I now present the society with the drill of full size. I. C."

[See plate 1, fig. 1.]

Mode of making Butter in Brittany. By F. Da Costa.

Nantz, 31st December, 1819.

Sir,

The recollection of your attention in showing me your cow establishment at Germantown, has suggested the idea of forwarding to you the process they have in Upper Brittany of making butter, which is a little different from the American mode. Should it be of any service to you, I shall feel much gratified.

Francis da Costa.

Reuben Haines, Esq.

MODE OF MAKING BUTTER,

As it is practised in the neighbourhood of Rennes in Brittany, where the best Butter in France is made.

Milk is composed of three parts, essentially different from each other; they are as follow:

1st. The aqueous part, called whey.

2d. The cheese part, which is substantial.

3d. The butter part, called cream, of an oily nature, and which comes up naturally to the surface of the milk even before its decomposition.

It is this cream that is turned out into butter by churning.

In order to make good butter, the decomposition of milk must have begun; I mean its three parts must be exactly separated, as it happens when it begins to turn sour. Milk must necessarily be sour before beginning

to churn ; but it is urgent to churn it as soon as it is sour, and not to wait its fermentation.

It must have curdled and soured of itself without fire. In the winter season, however, it is proper to pour a little sour milk into it to make it coagulate.

Though the cream is the elementary part of the butter, and neither the whey nor the cheese part contain any of it, yet it is necessary to throw into the churn the three parts of the milk, and to churn them all together. The reason of it is evident. The churning, which must be always uniform and continual, communicates a slight degree of heat, which would give a disagreeable taste to the butter, if the cream were churned alone ; while churning the whole together, the acidity of the whey tempers the heating effects of the churning, the cheese part helps the separation, and the butter comes fresh out of the churn. It is to preserve that fresh taste, that in summer our butter women, as soon as they perceive the small globules of butter beginning to form, do not fail to throw into the churn (by the hole of the churn-staff, and without stopping the churning) some pints of spring water every ten minutes, that is, a pint to every fifty or sixty pints of milk : in winter, on the contrary, they add warm water, which they pour in as soon as they begin to churn, in order to accelerate the slight degree of heat necessary for the formation of butter ; but when they perceive the first butter-globules forming round the churn staff, then they cease pouring warm water, and the temperature warns them from putting any more cool water. Thus, to make butter, it is required—

1st. That milk must have been curdled and soured, but not fermented.

2d. That milk must have been naturally soured, without any help but a small quantity of sour milk, and especially without warming it.

3d. That all the milk should be put into the churn together, and churned without extracting any parts of it.

4th. That the churning should be continual and always uniform, avoiding to strike the bottom of the churn.

5th. That churning, without interruption, communicates to the milk a slight degree of heat, which is necessary, and which in winter may be accelerated, by adding some warm water from the moment one begins to churn, and without stopping the churning motion.

6th. As soon as we perceive the little globules of butter forming, we must then think only to cool, with spring water, if in summer, for in winter it is not necessary.

7th. If, when we wish to churn, we have some sweet milk not yet sour, but which it is wished to churn, it must be put into the churn with the curdled milk twelve or fifteen hours, more or less according to the relative quantity, before beginning to churn, in order that the part of sweet milk which has added be entirely curdled.

8th. This mode is, no doubt, much longer than when the cream alone is churned; for one must churn during about two hours in the most favourable season, and it is common in winter to take four hours churning to have your butter made.

Preparation of Butter.

When butter is made, if the weather be hot, it is well after having gathered it in the churn, to let it cool about two hours; but when it is very hot weather, as that time is not sufficient to cool it, it is well to put it in a very cool place during some hours, till it is very firm, in order to extract the buttermilk out of it.

It is by kneading and turning repeatedly with a wooden box spoon, in a beech dish made of one piece, that the

women about Rennes extract the buttermilk; leaving it now and then to rest and grow hard, and then beginning again till it does not yield any buttermilk: it is only in the last extremity, and in the hot days of summer, that they knead it in cool water in order to extract the buttermilk out of it: they put nothing in it, but some salt for preserving and relishing it.

They never touch the butter but with the wooden box spoon, which must be impregnated, and also the dish, with some light brine, to prevent the butter from adhering.

All the utensils employed for milk must be carefully washed with boiling water every time they have been made use of, then washed again with cold water, and exposed to the sun, to prevent them getting a musty smell. It is necessary to remove from the dairy all disagreeable or strong smells, and to observe the most scrupulous cleanliness in it, but without humidity, which would give a mouldy taste to milk.

The churn is made of chesnut wood; it is scalded every time it is emptied to churn again; it is rubbed with a bunch of holly-oak, that scratches and cleans it well, and then washed again with cold water.

The pots and churn must keep no smell of the sour milk, and none of the utensils employed should be or have been put to any other uses, for fear of spoiling the whole.

Buttermilk.

In order to keep this buttermilk many days, one must extract its whey, that is sour; the means are as follow:

In the lower extremity of the churn level to the bottom, an opening must be made, that is, shut by a peg of about three or eight lines in diameter: after the butter is taken out of the churn, it is left to settle some time, to let

the whey have time to separate from the curd; then one takes out the peg, and makes all the whey run out into a basin, taking care to put the peg in as soon as the curd comes out. This whey is given to the hogs. If all the whey is not out of the churn, and the curd has a sour taste, one throws some pints of cool water in the churn, takes out the peg, and the water runs out, carrying with it the remaining whey. This milk may remain in the churn many days without any inconvenience; it may be given to hogs, to horses, and even to calves, mixed with a little sweet milk.

The butter made according to the above mentioned process is of an excellent quality, and superior to the best *Wonderly's butter*, in the spring, found in the Philadelphia market. I have been told when in England, that in some counties, as well as in some counties in the south of Ireland, the mode of churning the cream and milk of one milking altogether was in general use.

FRANCIS DA COSTA.

[In Europe few, if any, dairy-farms possess the great advantages we derive from our milk-houses built over springs of water; and substitutes are resorted to, for cooling the butter and keeping the milk, unusual with us. I have seen the milk, in large cheese dairies, churned without suffering it to rest, as we do, and throw up cream. Butter, too, is made from the fresh or new milk, of excellent quality. But it is questionable whether or not our mode be not the most economical and convenient. There is much difference of opinion, as to washing out the butter milk by cool water, in moderate quantities; or working it out entirely by the ladle. Success attends both modes practised by *intelligent* dairy women. The *hand* should be applied sparingly, if at all; the ladle (of wood) being far preferable. There is, too generally, a great omission of carefulness in attending to the cream collecting for churning. The vessels or cream-pots, should (in warm weather) be always kept in proper places surrounded by cold water; and it is indispensable that

the cream should be agitated or stirred, by clean rods or a flat spatula, twice every day. This is highly advantageous, and not generally attended to. The chemical reasons for this operation would, perhaps, be unnecessarily, theoretical. The oxygen of the air is essential to the preparation of the cream; or the conversion of it to butter in the churn. The more the particles are exposed to the influences of the air, gradually in the cream-pot;—constantly, but not violently, in the churn,—the sooner its conversion occurs, and the more valuable is the butter. Churning by water or machinery, often agitates the cream too violently; so that the oily parts are not sufficiently oxygenated. An injurious fermentation is also produced by the violent motion. Moderate movement is always the best, either with the churn-staff, or dashers. I was obliged to attend to these circumstances, when I had a very large dairy. R. P.]

To prevent Cows from sucking themselves. By Charles Roberts.

Philadelphia, 6th mo. (June) 19th, 1820.

Esteemed Friend,

A FRIEND of mine informs me that in a part of Chester county when it is desirable to prevent cows or calves from sucking, the end of the tongue is slit for about three-fourths of an inch. When it heals, it is forked, and ever after prevents their forming a vacuum in the mouth, without which they cannot suck a single drop. When I was a *cow-boy*, I well remember that one of the greatest crimes a cow could commit was to suck herself, and death was the inevitable consequence the succeeding autumn: much trouble was also after experienced from weaning-calves getting amongst the milch cows.

Should this simple preventive (which I suspect is but little known) prove useful, perhaps it may not be unacceptable to the Agricultural Society.

Thy friend,

CHARLES ROBERTS.

Roberts Vaux,
Sec. Philad. Agric. Soc.

On topping Indian Corn, and on the growth of Turnips among Corn. By J. C. Jones.

Rockland Place, 8th mo. (Aug.) 23d, 1819.

To the Curators.

Being desirous of promoting the laudable views of the Philadelphia Society for Promoting Agriculture, in obtaining and diffusing knowledge upon this very interesting subject, I have been induced to state my experience on the subject of raising turnips among Indian corn; and also on the early topping and blading of corn, which took place in the year 1817, and has since been confirmed, so far as respects the culture of turnips among my corn.

The following I have taken from my memorandum book, under date 11th mo. (Nov) 25th, 1817.

Having ascertained from experiment, that very fine turnips can be raised among Indian corn, merely by sowing the seed over the fresh ploughed ground on giving the corn the last dressing; I had turnip seed sown on the day following that on which mine was last dressed, viz. on the 18th of the seventh month last. Many of the turnips produced from these seed, which were pulled in the 11th month following, weighed from four to seven pounds each. They were of the flat and Norfolk kinds, principally the latter. The additional time and trouble of procuring said crop of turnips, (gathering in excepted) must be confined entirely to sowing the seed, as they were not even harrowed or brushed in; the latter probably might have been of advantage,—the former I object to, on account of covering many of the seed so deep, as to prevent their vegetating.

It may not be improper to state the nature of the ground on which these turnips grew, and how managed. I therefore subjoin the following: viz. the soil is of a good quality, and about the medium between a light and heavy loam, and the fall preceding it was under a stiff sward.

The latter part of the 11th mo. 1816, I had it ploughed about seven inches deep, the furrow slices well turned over, and a few days after the ploughing, the ground was well harrowed, first in the direction of the furrows, and secondly, cross-wise, levelling and filling up the interstices. In this state the ground remained until the 5th mo. (May) following, about the 10th of which had it well harrowed in both directions, and on the 13th the corn was planted in hills at the intersection of furrows previously marked out at the distance of five feet apart each way, with seed soaked in a strong liquor of horse manure and water, for forty-eight hours, which after draining a little, was well rolled in plaster of paris. In the culture of the corn throughout the season, particular care was taken in harrowing and shallow ploughing, to disturb the sward below as little as practicable; produce of shelled corn per acre, sixty bushels. The only manure applied to said ground was leached ashes, say ten two-horse cart loads to the acre, spread over the surface and incorporated with it, by being well harrowed just previously to planting the corn.

As an early topping and blading of the corn, for the free admission of sun and air, to promote the growth of the turnips would be desirable, it therefore becomes an object of consequence to ascertain the most early period that the topping and blading can be effected without injury to the growth and filling of the corn. With a view to the ascertaining this period, I adopted the following experiment, made on the 3d of the 9th month last, on nine hills of corn, being of the average quality, the stalks

and blades, of which were quite green. On seven of the said nine hills, (on cutting off the upper part of the stalks,) I left one joint of each stalk next above the most elevated ears: on the other two hills I left no joint above the highest ears; from one of these hills the blades were entirely taken off, except those immediately connected with the ears, and from the other those were also taken off. Three hills of the seven were also bladed as above. Considerable sap issued from some of the stalks whilst topping: it was also remarked, that some of the ears had attained their full size, others nearly so, whereas some others appeared not much more than half grown, but the grains in those the most forward, were in a soft state. The topping and blading my corn generally, was not commenced until the 25th of said ninth month, when the grains of corn had mostly attained their full size, and were tolerably hard. On gathering in my crop of corn, about the middle of the 11 mo. (Nov.) I found the result between the early and late topping and blading, on accurately weighing the produce of the same number of hills of each, to be thirty per cent. in favour of the latter. It therefore appears much more proper to delay the operation until the grains have attained their full size, and generally passed their soft or milky state. As regards the different modes pursued, as above stated, in respect to the nine hills, no difference was observed worthy of being noted.

Your friend,

ISAAC C. JONES.

On the method of burning Mud or Clay. By J. Warner.

Wilmington, February 1st, 1820.

Dear Sir,

In compliance with your request, I communicate, for the information of your friend, the following remarks in relation to the experiments made by me in clay or mud burning.

I commenced mud-burning in 1815. During that year I burned about one hundred and seventy cart loads, and about one hundred bushels of oyster shells, in a single heap. The mud was principally blue mud, obtained from the clearing of drains or ditches, being thrown out in the spring upon the edge of the drain, where it remained until harvest, when it had become generally dry throughout. I began the fire or kiln with about one-third of an oak rail, which being completely on fire, I applied to it the lightest and dryest mud or tussocks that I could procure. The fire should be kept well covered, and if it burn rapidly, and the flame or smoke penetrate through any aperture, it should be covered with fine earth, which confines the heat and causes the mud to burn inwardly. Around and adjoining the first heap, when you are satisfied that it is completely on fire, you should commence three or four other fires, similar to the first, with which they will very soon become connected; and thus you may proceed with small fires around the original heap and on the surface of the ground, until you have disposed of all the mud you intend to burn. This method may be recommended for two reasons: first, it

increases the body of fire below, and thereby prevents the danger of extinguishment; and secondly, it keeps the top of the heap within your reach, which it is necessary to keep pretty heavily dressed. To ascertain how the heap is burning, I carry with me a strong stick or cane, which I run into the heap, and thereby discover the distance from the outside to the ashes; and as it generally happens that one side of the heap burns much more rapidly than the other, it is necessary to dress that side the heaviest. I use no flues to give air, being satisfied that the mud burns much better when the air is excluded.

In the year 1816, I burned six or seven hundred cart loads. A part of this was done in small heaps, on a piece of high marsh overrun with elders: the marsh was ploughed about four inches deep, and the surface burned and spread over the same ground. From this experiment I derived little or no benefit, and I am therefore induced to believe that paring and burning are injurious, even where the whole quantity of ashes is spread over the same ground.

During last season, I burned altogether in small heaps of from three to eight cart loads each, which saved the expense of cartage. I prefer this mode for another reason; the process is much more expeditious when the burning is done in small heaps, than in large; in the first case the manure is ready in two or three weeks, in the latter it requires two or three months.

About two bushels of oyster or marine shells may be beneficially burned with each cart load of mud. When this is done, the mud must be in large heaps. After the heap is well on fire, give a very light dressing of shells over the surface of the heap, so as to permit the fire to communicate from below the shells to the dressing of mud above them.

It is proper to state, that wood is only necessary at

the commencement of the operation, which requires great care and judgment. When it is once on fire thoroughly, the mud will prove sufficiently combustible to keep the fire alive.

The proper season may be assigned from the first of May until the middle of September, taking care to select a dry time to commence with the heap; after it is fairly in operation, I conceive some rain to be beneficial, as it has a tendency to confine the heat.

Marsh mud of any kind is excellent for burning, and with it every kind of shrubs or roots which are commonly found in a marsh, such as tussocks, elders, &c.; also any species of earth taken from swamps or meadow ground, that is free from sand. Clay of every description makes a strong fire when once commenced. Although I have never tried this species of earth myself, yet in travelling last summer about fifteen miles from this place, I saw a heap containing about one hundred loads of handsome ashes burned from stiff blue clay. This was burned upon Cobbett's plan; and in the same field there were also many small heaps burned upon the plan I have laid down. The owner of the farm was not acquainted with the method of increasing the heaps, which I explained to him, and he expressed his intention of adopting that plan, in order to save fuel, and the expense of building clay walls according to the English practice.

I consider the ashes procured in this way a cheap and valuable manure. The reduction in quantity is about one-third, and I have ascertained in one instance the expense to be about twelve cents a common cart load, allowing the hands employed one dollar a day each, and three dollars a day for two carts and a driver. My crops of wheat from this method of manuring, have been equal if not superior to those dressed with stable or barn yard manure. There should be from forty to fifty cart loads

of ashes per acre. I have made an experiment of top dressing meadow ground: the effect it produced was, that the cattle turned into that meadow to graze, would eat the grass of the part manured in this way perfectly bare, before they would touch any other part of the pasture. I have this season about nine acres of wheat manured with mud ashes that promise well. In an adjoining farm, a fair experiment is now making by Mr. John Woolston, who has manured with burnt mud about three acres of land, and an equal quantity with stable manure: the remainder of the field is manured with lime, fifty bushels to the acre. There is but little difference visible in the parcels on which the burned mud and stable manure have been put, but their superiority over that which has been limed is very apparent.

Very respectfully your friend,

JOHN WARNER

C. A. Rodney, esq.

[How importantly encouraging is the foregoing communication! Mr. Warner merits the thanks of thousands who have the like opportunities, and do not, though they yet may, embrace them. The blue mud of our marshes, if treated as Mr. Warner has practised, is an invaluable treasure. But those who have it at hand, are the most incredulous of its worth. Very many of such characters possess clay soils, on which, (though otherwise in sandy or light soils,) in its raw state, it is feeble and inefficacious. A chemical analysis would convince any intelligent and scientific person of this fact. A mere cover of vegetable mould on a sub-stratum of clay, is not sufficient to give the raw mud immediate activity; nor is its mixture with farm-yard manure more profitable. But if the proprietors of such soils, would burn the substrata of clay into ashes, in the mode pointed out in our volumes and almanacs, or in the manner detailed by Mr. Warner, they would not require blue mud, or any other auxiliary to fertility. The use of *dung* has been so long impressed upon our farmers, that they overlook the treasures they possess in abundance, whilst they place their sole

dependance upon a manure, however valuable it may be as far as it will go, yet to be obtained in limited and incompetent quantities; and in its nature fugacious, and of short duration. Whereas burnt clay, or burnt blue mud, is to be acquired in vast abundance, and is preferable to *dung*, both in effect, economy, and duration.

Let any unprejudiced farmer read, in our volumes, and the authorities therein cited, the facts proving the almost magical "effects of *fire* on soils," and he will banish all incredulity on such subjects. Since I communicated my experience on this topic, in our third Volume, page 214, I have met with many instances in corroboration; and am confirmed, incontrovertibly, in all I have said recommendatory of the practice. In my early life, I had much experience in the application of river mud, in all the modes *then known*. I therefore do not treat the subject as a mere theorist; but with practical knowledge. Burning either mud or clay into ashes, was, in my youth, unknown. The blue mud was then pulverised by being exposed in ridges, to a winter's frosts; and applied to *loamy* or *sandy* soils, with surprising effect. Without decomposition, it lies, for years, an inert mass. *Fire, frost,* or *time,* when lying in a cover of frequently stirred soil, will produce the required decomposition. One-third of the mud, burnt into ashes, will fertilise more than three times the quantity of the raw material. The like effect is produced by clay ashes. But Mr. Warner's allowance of fifty cart-loads of *mud ashes* to the acre, is profuse. In all the accounts of the requisite quantities of *clay ashes,* I have never seen or heard of more than 25 to 30 cart-loads being spread on an acre. R. P.

May, 1815.]

On burning Clay. By William Shotwell.

New York 9th mo. (Sept.) 1820.

AGREEABLY to my promise, I hand the direction for burning clay for manure; the process is so simple, that it is hardly possible for any one to miss it.

In the first place, plough a piece of clay ground when pretty wet, as deep as you conveniently can; let it remain till a dry season, when a cross pile of wood, four feet in length, two feet in height, and sufficiently compact to burn well, is to be built. You are to build a bank of clay sods, two feet thick, around the wood, and about two and a half feet high; and then to set fire to the bottom of the wood in several places; when completely on fire, a light covering of sods is to be put over the top, which by degrees continue, until you have nearly closed up every avenue for the smoke to escape. Now begin throwing lumps of clay and sods on such parts as you find the smoke escaping through. Should the fire be making too rapid a progress, you are to select the clay with which you will generally be able to keep it within bounds, especially if there should be moisture in it. But in case you are not able to keep it down, you should with shovels throw on fine clay; on the other hand, if the process is too tardy, let a larger portion of sods be substituted, but during the whole process care must be taken to lose as little smoke as possible. At night, when leaving the kiln, you should give it a double coat of fine clay, which will generally retain the smoke till early on the ensuing morning. It will be found most convenient to make the kilns to contain twenty to thirty loads, as there will be less labour in carrying the clay

to them; and by having them dispersed, there will be less carting of the ashes.

It will require from ten days to three weeks to burn a kiln. The length of time will depend on the weather, the quantity of wood used, and the size of the kiln. The ashes are excellent manure for grain, grass, turnips, and other vegetables. A large quart of well burnt ashes for a hill of Indian corn, twenty loads for an acre of wheat or grass, are the proper proportions.

Respectfully, thy friend,

WILLIAM SHOTWELL.

Reuben Haines.

[*Cart loads* is indefinite. My information is, that two horse cart loads, are meant. Some say three horse cart loads, or a cart load drawn by a pair of oxen. R. P.]

On Millet. By Nathan Harper.

Frankford, 4th mo. (April) 7th, 1820.

Respected Friend,

I WILL cheerfully communicate, as far as my knowledge extends, the information thou wouldst like to have respecting *Millet*. It will grow on any soil, but a light loam suits it best; it will produce from 20 to 30 bushels of seed per acre; the seed is good food for horses, cows or swine, and on a farm where there is poultry raised, it is very nice food for young chickens; the straw is good fodder, both cattle and horses are fond of it; I consider it equal to equal quantities of clover hay, and where land has become what the farmers call clover-sick, I think it is an excellent substitute. It is an annual plant, and must be sown every spring; it will produce from two to three tons per acre; it is sown in the fourth month—I believe the fore part of the month is the best time; it is generally cut in the seventh month; it ought to stand until about half the seed is ripe before it is cut for hay, and when given to the cattle in the winter, the ripe seed will fall off on the barn floor, and with a little care can be collected for seed the ensuing spring; about half a bushel of seed to the acre is sufficient—some say less. I consider this plant most valuable as a substitute for the artificial grasses; after such a dry season as we had last summer, almost all the clover and timothy seed sown last spring perished. The millet, when cut either for hay or seed, sprouts immediately, like the orchard grass, and makes very good fall pasture. The hay from this plant is most valuable if left standing until the seed

be fully ripe: the difficulty is very great to get the straw dry without losing the greater part of the seed in the field. I have no doubt it would answer a good purpose to sow it on purpose for pasture for milch cows.

Respectfully, thy friend,

NATHAN HARPER.

Isaac C. Jones.

In a note which I received from Nathan Harper, under date 4th mo. 15th, 1820, he mentioned a mistake that he had made, in the above letter, relative to the proper quantity of seed requisite to be sown on an acre of ground; he therein mentioned about half a bushel per acre, whereas one peck was sufficient.

ISAAC C. JONES.

[I have, during several years past, cultivated the millet, I mean that species called *millium*. I think less than half a bushel to the acre, sown for seed, often produces coarse straw, though the seed is greater in quantity. I have sown it in May, and even June, with equal success. Last season, a neighbour sowed on stubble, after harvest, a week or two. He had a good crop of hay or fodder, but the seed did not ripen sufficiently. I think it well worth the culture as an excellent fodder, and a valuable substitute for hay, when failure in grass crops has occurred.

R. P.

May, 1825.]

On feeding Cows with steamed Wheat-Chaff.
By J. P. Smith.

Burlington, 5th mo. (May) 18th, 1820.

Esteemed Friend,

THE letter thou addressed to my father requesting information of the plan we pursued last winter in feeding our cows, he wishes me to answer, as I more particularly attended to them. I will endeavour to relate the mode as nearly as I can. The saving of hay by this method of feeding has been considerable.

In the latter part of the fall, we commenced threshing our wheat with Hambly and Pitt's machine. The straw being dry, a considerable part was cut up and blown out with the chaff. We concluded it would answer a good purpose to pickle this chaff and feed it out to the cows, which was accordingly done. It was eaten, but not with as much relish as we expected. We then concluded that steaming it would probably be more advantageous, (by softening and warming it) and pursued our plan in the following manner. We had a light hogshead, (large enough to contain chaff for two messes) which we filled every night, and poured in three or four buckets of scalding water. It remained in this state, with a cover to confine the steam, till morning. We then took out enough of the steamed chaff for one feeding, and threw it into a mess-box with a small quantity of salt, and one pint of ground rye and corn, to each cow, and mixed the whole together. Of this mess we gave a half bushel well heaped to each cow, the residue in the hogshead we fed out, after the same manner, in the evening.

noon we gave them corn stalks. We fed fourteen cows for five months in the above mentioned manner. They ate during this time about two tons of hay, and which was principally given them in the spring. The young cattle were not fed in this way: with the horses there was no particular economy used. It was remarked by those who saw the cows, that they looked very well, and the quantity of milk from the milch cows was thought to have increased. We were very particular to have their stalls well littered every night with dry straw, which no doubt promoted their thriving condition.

With respect, I remain thy friend,

JOSEPH P. SMITH.

Isaac C. Jones.

P. S. I give a rough calculation of the probable economy of this plan, compared with that of feeding hay. We estimate the ground stuff at seventy cents per bushel. The chaff is not considered in the calculation, as it was before generally applied to very little use: the hay we calculate at fourteen dollars per ton, though none was selling here under sixteen dollars.

Keep of cows for 5 months, at 31 cts. per day,	$46 50
Do. 2 tons hay, at 14 dolls. - -	28 00
	$74 50

Their keep on hay alone, allowing each cow to eat 1½ tons in 5 months, would be 21 tons, at $14 per ton, - -	$294 00
Saving,	$219 50

Plate 2.

Tide Trunk.

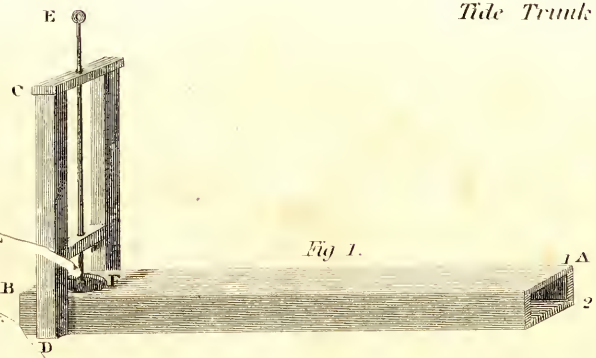


Fig 1.

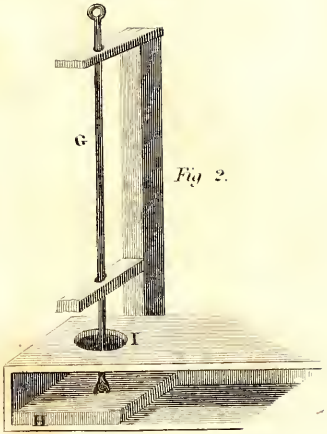


Fig 2.

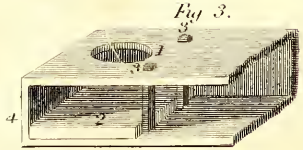


Fig 3.

Shotwells Easy Weeder

Drawn by G. Strickland.

Engraved by J. Yeager.

Mr. Garnett referred the Society for a more full description of the Tide Trunk than he gave, and for a Cut of it, to the 2d Vol. of Skinner's American Farmer :—the following Explanation is therefore taken from that Work.

EXPLANATION OF THE PLATE.

"Fig. 1.—A B represents the trunk, open at the end A, and closed at B, with an aperture on the top at F, near the end B; the frame C D is attached to the trunk, and is intended to hold the iron rod E, in a perpendicular position, which is attached at the lower end to the valve, and holds it in its place. This valve, floating with the flowing of the tide into the trunk at A, rises and closes the aperture F perfectly, so soon as the water rises to the top of the trunk.

Fig. 2. represents this perpendicular iron rod G, passing through the external frame, and the aperture at I, and attached to the valve H by a hook. This iron rod must be allowed to play with perfect ease through the frame, and be so light as not to prevent the valve from floating, and if there be any apprehension of its sinking the valve, the under surface of the valve may be coated with cork to make it sufficiently buoyant to rise with the rod.

Fig. 3. represents an interior view of the end of the trunk.—1. The aperture at the top. 4. The end next to the marsh closed: 2. The valve lying at the bottom: 3. Two perpendicular rods passing through the trunk, and intended to confine the valve in its place, instead of the rod described in fig. 2. which method of retaining the valve in its place, has its advantages, and is by some preferred to the rod. The upper surface of the valve must be smooth, and made to fit closely the under surface of the top of the trunk round the aperture, in whatever way it may float up to it. When the tide recedes, the valve falls to the bottom, opens the aperture at F, fig. 1. and the water from the marsh pours into the trunk, and runs off into the river at A, fig. 1.

This trunk has been found, on actual experiment to exclude every drop of water from the flood tide; but as the water proposed to be drained off, must flow over the top of the trunk, and

descend into the aperture, and as it is important that the marsh should be drained as nearly down to low water mark as possible, it will be proper to observe, that this trunk, whatever may be its width or depth from 1 to 2, fig. 1. should not be placed with the interior surface of the top, more than six inches above the ordinary low water mark; because there should be room left for the water, pouring into the aperture from the marsh, to clear itself over the valve, which floats on the low tide, or descends, on the tides receding so much, to the bottom of the trunk. The height from low water mark to the top of the trunk, being so much deducted from the depth to which the marsh can be drained by the trunk; it should, therefore, to pass the greatest quantity of water, be made broad in proportion to its depth, so as to allow of a large aperture, and be placed as low as is compatible with its object and utility.

If one trunk should not be adequate to the necessary draining, two or more may be inserted, and as the tides are irregular, and often fall lower than common, it might be well to place one trunk lower down on a level, with such uncommon low tides, so as to take advantage of the greatest degree of draining which such tides would afford."

On the improvement of a Tide Trunk. By James Garnet.

Philadelphia, Nov. 8th, 1820.

Gentlemen,

HAVING long witnessed the zeal and ability, with which your Society devote themselves to every thing connected with the rural economy of our country, I have taken the liberty to present you with the model of a tide trunk,* which has been for some time tried in Virginia with complete success. It is used for reclaiming land liable to be overflowed, and upon which water from the land-side is apt to accumulate. If it is not already in your possession, this trunk, I think, will be found highly beneficial; as nothing of the kind yet known to us, can surpass it, either for the simplicity, or economy of its construction.

With great respect and esteem, I am

JAMES M. GARNETT.

To the Philad. Society
for promoting Agriculture.

EXPLANATION.

The black marks indicate the position of small strips of wood which are nailed on the two side planks, to prevent the floating valve or stopper, from either passing out with the receding tide; or from lying flat on the bottom, when all the water has run out. The top of the valve, which should be made of some light wood, must be covered with seal-leather. This soon becomes wet; and from its elasticity, stops the hole, when the trunk is full of water, as tight as a well-corked bottle.

[* See plate I. fig. 2.]

On an Easy Weeder. By James T. Talman.

Flushing, (*L. Island, N. Y.*) 12*th Nov.* 1820.

Dear Sir,

Owing to indisposition, I am obliged to send you the weeder unfinished.* It requires to be ground on the *upper side all round*, so as to cut backward as well as forward, and with the ends, where the plants are nearer than the breadth of the tool. The handle should be sufficiently long to be used without stooping, and a ball on the end, for the palm, will be found very convenient.

With like instruments, from $3\frac{1}{2}$ to 8 inches in width, I cultivated one garden, this summer, (three-fourths of an acre) without using the common hoe, or the hand, to weed with, and am satisfied that a great deal more work can be done in a given time with this tool, than the hoe, and with much less labour; but the same objection lies against it, that has been brought against all hoes, namely, that they stir the ground, but do not expose a new surface to the action of the atmosphere. This effect cannot be produced by any garden tool that I have seen, and as I am fully persuaded of the advantage to be derived by growing plants by frequently exposing a new surface to the air, I have thought a small plough might be constructed to answer the purpose. The share about 4 or $4\frac{1}{2}$ inches wide at the heel—a wheel in the end of the beam to prevent the point of the share from going too deep—and the handle at the proper angle to give the weight as well as strength of the body a share of the labour. If such an instrument can be used without any extra exertion of strength, it will do more work in three

[* See plate I. fig. 3.]

hours, than any man can do equally well with a hoe in twelve. I contemplated a trial of it last summer, but could not get it made in season. It should be used early, before the ground bakes, (as our gardens about here generally do) and by frequent use I believe the ground may be kept in as highly pulverised state, as when first broke up in the spring. There was a tool somewhat similar on the piazza at Mount Vernon, but that was intended to be pulled like a hoe, and I am confident it will not answer; the ground will offer too great resistance to that operation. I should be glad to hear from you when at leisure, your opinion of the practicability of such a plough, and whether you have ever seen any thing of the kind in operation. The share might be made of sheet iron. It would last a long time in ground so free from stones as gardens generally are, and would be preferable on account of its lightness.

The expense of the weeder is so trifling, it is not worth attention.

Very truly, your friend,
JAMES T. TALMAN.

Reuben Haines.

On the culture of the Grape Vine. By Isaac C. Jones.

Philadelphia, 11th mo. (Nov.) 13th, 1820.

I KNOW of no description of fruit, more delightful to the palate, than some species of the grape, and none, I believe, which is generally considered more wholesome; particularly some of the more delicate kinds of the European and other foreign grapes, which it has been considered almost impracticable to cultivate to advantage in this climate; excepting in some well protected and southernly exposed situations, within the verge of our cities. I have heard of many attempts being made in the country, to cultivate the white sweetwater, and some other tender kinds, without success; and that it has nearly been given over as a hopeless case. Then how desirable it will be to those, who properly appreciate the culture of the vine, to have any information elicited upon the subject, having a tendency to obviate the difficulty. Judging from a plan I have been in the practice of pursuing these two years past, I am induced to believe we can succeed in the country nearly, if not quite, as well as those who have some of the most favourable situations in the city.

My plan is to trim my vines of the most tender descriptions in the fall; say from the first to the tenth of the Eleventh month (November;) after which, to take them down from the arbour to which they have been attached through the season, and lay them upon the surface of the ground; then to cover them over with the adjoining soil, about four to five inches in depth: and so let them remain till the next ensuing spring, say until after the severe frosts are past. I have let mine remain in that state until

the ninth or twelfth of the Fourth month (April) On uncovering them, they have uniformly had a fresh, healthy appearance, and I have discovered no bleeding of the vines; to prevent which, I consider the fall trimming of importance, on account of the necessity of letting them remain in the covered state to so late a period in the season. If the vines should have attained a considerable size, some care will be requisite in laying them down, that a tolerably regular curve be formed near the bottom; otherwise, the woody fibres may be so much strained as to injure them; but this is easily prevented, by previously raising the earth round the foot of the vine, to the height of one, two, or three feet, according to its size.

To the adoption of this practice of covering with earth (as no greater degree of cold, can penetrate through the covering, than 32 degrees of Fahrenheit,) I have attributed some handsome crops obtained, of my white sweetwater, and also some very fine bunches, this season, from a young vine called the Montesquieu, which I consider a remarkably fine grape, originally introduced from France.

I remain your friend,
ISAAC C. JONES.

Curators of the
Phil. Agric. Society.

P. S.—It will be best, to insure the vines from bleeding in the spring, to omit covering them for a week or ten days, after trimming in the fall, in order that the wounds occasioned by trimming may have time to dry, and the pores in some measure become closed by exposure to the atmosphere. I. C. J.

[I have been in the practice of laying down in the fall, and covering my grape vines, during at least thirty years. I sometimes trim them in the autumn; but most commonly in the

month of March or beginning of April, after throwing off the cover of earth; which I lay on from twelve to eighteen inches thick. I have never found any injury occasioned by spring trimming. General Moreau, the spring preceding his departure for Europe, viewed my little vineyard, which *had* consisted of about one hundred vines. I had, for the first time, most unfortunately omitted the usual cover. The consequence was, that I lost fifty of the European grape vines. But the survivors, chiefly of what we call the Cape vine,* had resisted the frosts, and produced a good crop; as did also some native grapes I had cultivated. I have never since omitted covering; and have generally had encouraging crops. I am satisfied, that we can procure in our own country excellent grapes; which, being naturally acclimated, would be safe and productive: whereas the imported grape is uncertain in its product, (in the country,) and subject to more casualties, both from frosts, mildews and blasts, as well as from the ravages of insects, than are our native vines; which could be obtained from many parts of our own extensive country; and require only experience and intelligent culture, to rival the best foreign grapes. General Moreau informed me, that he had been obliged to cover, with earth, his foreign vines since his arrival among us; having met with a similar disaster to mine from the omission. He told me that even near Paris, the gardeners who supplied that city with figs, found it necessary to cover the fig plants every winter. I have generally been in this practice, with some exceptions. Whensoever I omitted it, I have had cause for repentance. During our revolution, the French officers often visited me, when I had great abundance of excellent figs. They declared they had never ate better of the kind, (the blue and the red fig) in France. I have now only a few of this article; which I find is eaten with pleasure by very few people. I continue to relish them highly; and prefer them to most other fruits. R. Peters.

May, 1825.]

* This is a native: it is the Alexander or Tasker grape.

On the culture of Indian Corn as a fodder.
By J. G. Thomson.

The Hills, Dec. 8th, 1820.

Dear sir,

It would afford me great pleasure to give you any satisfactory information on the subject of your note of November 22d. The trial which I made of Indian corn as a green food for cows, was so far successful, as to induce me to believe that it may be thus used with advantage, especially in dry seasons. My experiment was made in the summer of 1819, and without any particularity, being left to the management of two men, who were directed to give the animals a sufficiency, avoiding waste as much as possible. The impression on my mind was, that in that uncommonly dry summer, twelve cows were kept in better condition by the produce of one acre, that any one of them would have been if grazed upon the same ground. The soil on which the experiment was made is a dry gravel, from which the clover was completely burnt off that season. The quantity directed to be sown was three bushels per acre, and the mode of doing it as follows. The grain was sown late in the afternoon on the sod, and lay all night uncovered—a light furrow was turned over it very early next morning; and it was a part of the plan never to sow more in the evening than could be covered with the plough before the dew had evaporated. We made several sowings at intervals of ten or twelve days, in order to have a succession; and we usually passed a roller over after the plough. We began to cut when it was about three feet

high, and the whole was used in its green state. The milk of the cows fed on it was abundant and well flavoured, and the butter made from our family cows excellent. They had a daily supply of salt, which was thrown upon the coarser stalks to induce them to eat the whole. The waste was inconsiderable, and the saving of manure great.

It may be proper here to remark, that when the corn has been once cut, it never sprouts again, but leaves the ground in a very clean state, as no weeds can rise among it.

More than my usual occupation, and a pair of bad eyes must be my apology for neglecting to answer your note till this time. If my answer contains any hint interesting to yourself, or to the Society which you represent, I shall be glad that the inquiry has been made.

I remain, yours, &c.

J. G. THOMSON.

Richard Wistar, jr.
Sec'y. Philad. Agric. Soc.

Newtown, Bucks County, March 20th, 1820.

Sir,

In pursuance of a resolution passed at a stated meeting of the Bucks County Agricultural Society, held the 12th February last, I forward you the enclosed communications to be published in such manner as the Philadelphia Society for promoting Agriculture may deem proper.

I am, very respectfully,

Th. G. Kennedy,
Sec. of the Agric. Soc. of Bucks County.

Roberts Vaux,
Sec. Philad. Agric. Soc.

"And if he be not able to bring a lamb, then he shall bring for his trespass which he hath committed, two turtle doves or two young pidgeons."—*Leviticus*, ch. 5, v. 7.

On raising Potatoes. By John Linton.

Sir,

Not being able to bring a bull or a heifer from my herd, as an offering to the Society, I have brought a potato. The potato was raised in one of the beds of earth which were hauled from a ditch, which I caused to be cut in the year 1808, through a piece of bottom meadow ground, for the purpose of carrying the water from the spring, and preventing the overflowing of the milk-

house during the time of high freshets: which ditch was completely filled up again, by washings from the barn yard and other parts adjoining. Upon these beds I had thrown a covering of corn cobs, which had been collecting for several years, and were in different stages of decomposition, from complete manure to the dry cob. In addition to this, I threw upon each heap of earth a covering of brush, which had been trimmed from an adjoining orchard.

At a time when the wind was favourable, and blew the course of the dirt heaps, I set fire to them, which consumed all the brush and a considerable part of the cobs. The beds were then turned over at different times with the plough, so as to blend the whole together, and one of them planted with potatoes. The potatoes were received in exchange for some of my Yankees, were termed the Scotts Grays, and were rather more than half a peck in quantity. They were all of a suitable size for culinary purposes: each potato being divided into two equal parts, and planted fifteen or eighteen inches asunder, and whitened with a coat of plaster of Paris before covering. When they were gathered from the bed, they measured seven and one-half bushels, of quite a large size, and of a superior quality. I have frequently made experiments in the potato crop, by planting seed of different sizes, but have uniformly found that I could raise the largest by planting the largest potatoes. And as far as my experience extends, it appears to answer the best purpose to divide the potato lengthwise into two equal parts; it will then generally putrefy, and by its moisture afford a proportion of nourishment to the plant whilst it is young: whereas a potato which is planted whole, will generally be found entire at the time of gathering the crop.

The potato herewith presented, at the time of gathering

weighed two pounds and three quarters, but owing to evaporation is now reduced to two pounds and one half. They were generally of a large size, and owing to the richness of the bed and their elevated situation, being raised fifteen or eighteen inches above the surface of the ground adjoining, of a superior quality. One bunch which I dug up separately, afforded thirteen potatoes, all of them of a large size.

If I had planted with potatoes the whole of the earth which came out of the ditch, they would have amounted to upwards of thirty bushels from a similar yield, which would have been a full compensation for all the expense and trouble I was at, in procuring and preparing the earth: leaving me in possession of not less than two hundred cart-loads of excellent manure, free from expense. I am therefore of the opinion it would be advantageous to prepare a bed in the same manner, every season; which is very practicable for all those who live adjoining streams of water, and can procure pond earth even if of an inferior quality; because by the addition of a small quantity of manure from the barn yard, and an admixture of common salt, it is in the power of every such person to raise potatoes sufficient for the use of his family, of a superior quality: the crop being a full compensation for the expense and trouble of collecting and preparing the bed.

In the fall of the year, when the swamps and low pieces of ground are the clearest from water, a couple of hands, each having a cart and horse, would collect in a week or ten days, a quantity of earth sufficient for the raising of potatoes enough the ensuing season for the use of a common family; and the earth by being completely pulverised in tending the potatoes, will afford sufficient manure, of a good quality, for a top dressing of ten or fifteen acres: which may either be used immediately after digging the potatoes upon a wheat fallow, or suffered to remain until

the ensuing season, and spread upon the corn ground after it is broken up; by which means you will obtain a three-fold advantage from the manure, as it will not only be an advantage to the corn crop, but will add considerably to the ensuing crop of oats or wheat, or even both.

Upon the other bed of earth I raised turnips and radishes enough for the use of my family, and more than a bushel of beets; which being transplanted from my garden did not attain to a remarkable size, as they were very short; a transplanted beet seldom if ever growing a greater length than they are at the time of transplanting. In addition to the turnips and beets, I had one hill of pumpkins, from three seeds, which bore one hundred and four pumpkins of different sizes. Seventy of these came to perfection, the smallest of the seventy being about the size of a common iron tea kettle.

Respectfully yours, &c.

JOHN LINTON.

James Worth, Esq.
Pres. Agric. Soc. of Bucks' County.

On the Hessian Fly. By John Linton.

April 30th, 1821.

Sir,

Some time during the last winter, my very respectable neighbour *Lambert Torbert*, informed me that during the last fall he made a partial experiment with a small bush, or branch from a tree, which he dragged by hand at several different times, over a small part of his wheat-field, and gave it as his opinion, that something of a similar nature, would answer a valuable purpose in preventing the ravages of the Hessian Fly, as they were in a great measure destroyed by the bush, upon that particular part of the field. This subject has been before the view of my mind at several different times since the above information, and being of the opinion, that a machine may be constructed upon a very simple plan, and with a trifling expense, which will answer a valuable purpose, I have been induced to construct one, a model of which is herewith presented to the Society. The machine should be twelve feet long, which will be sufficient completely to brush over one half of a common sowing land, and will permit one of the wheels to run along the furrow during the operation. The axle-trees are made of white pine scantling three by four inches. The wheels are made of plank, and are fourteen inches in diameter. In the axle-tree are eleven holes bored with an inch and a half auger one foot asunder, and in each of these holes a branch from the red cedar is fastened, extending from the axle-tree about seven feet. Branches from the cedar, spruce or pine would be preferable for the spring

brushing, as they would more effectually sweep the ground, and would not lacerate the young wheat so much as branches from a common tree when divested of their foliage. A small staple is put in each end of the axle-tree about two and a half feet from the end, to which a couple of chains or ropes can be fastened, by which the machine is dragged by a single horse after the manner of a gleaning rake. About three feet from the axle-tree a piece of common lath may be placed parallel to the axle-tree, to which each branch of brush can be lashed fast by a small cord, so as to bring them upon a horizontal line, and prevent any one from bearing with greater force than the others upon the young wheat. The brush can also be regulated or placed equi-distant by means of the lath, and accidental vacancies supplied by inserting an additional branch. A machine upon this plan will effectually brush the ground for the distance of one half of a common eight pace land, and can be increased in weight so as to rake the ground with any degree of violence which may be judged necessary; and it is confidently expected will in a great measure sweep off the young caterpillars after they commence their progress down the leaf; and in cold mornings when the fly will be in a torpid state, a great number will be crushed in pieces by the operation of the machine. The whole of the expense will not exceed one dollar, and it is so simple in the plan, that any common farmer who can handle a saw, an auger and a drawing-knife, can construct one for himself.

Upon a trial of the machine, it is found that the wheels are too small, as they do not prevent the axle-tree from bearing upon the ground, in crossing over uneven parts of the field. I therefore recommend a wheel of two and one half or three feet in diameter, after the form of a drill-wheel. With such a machine, a field of twenty

acres can be brushed over in one day, and can be managed by any active, trusty boy, of twelve or fifteen years old, without making any vacancies, as one of the wheels will run along the furrow during the operation.

The plan is new to me and no doubt the machine will admit of great improvement.

I thought it my duty as a member of the Society to lay the implement before them at the present meeting, as the time is at hand for putting it into immediate operation.

Yours, &c.

JOHN LINTON.

Thomas G. Kennedy, Esq.
Sec. of the Agric. Soc. of Bucks County.

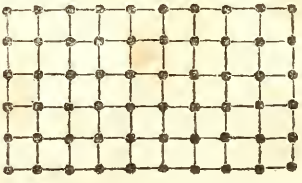
See plate II. fig. 1.

Method of preparing and inoculating Land for permanent pasture, by John Blomfield, of Warham, Norfolk. Communicated in a letter to James Mease, M. D. dated

July 13*th*, 1821.

"I SHALL now give you the method of preparing and inoculating land for permanent pasture.

The spot intended for pasture should previously be well summer-fallowed, for one whole year, that it may be perfectly clear from weeds, or whatever may obstruct the growth of the grasses. Then choose the very best piece of old pasture, the older the better, which contains the most natural grasses, but suited to the soil, on which they are to be transplanted. The transplanting may be done any time during the winter, but the earlier the better, as the pasture will be so much the forwarder in the spring. Plough up the old pasture in furrows of six inches in width, and not more than three inches in thickness, but if the turf has to be moved to such a distance as to become expensive, it may be taken as thin as possible. Cart the turf and spread it over the land, cut into pieces of about two or three inches square. Scarify the land twice with the teeth of the scarifier nine inches apart, leaving the surface

thus, 

when a piece of turf of the size described, is placed at every corner, where the teeth of the scarifier intersect

each other. The transplanting of the turf is performed by men, and by children of ten or twelve years of age, six children to each man, each child having a common table fork; they are placed before the men, each taking their rows, where the teeth of the scarifier have made the marks, and with the fork, places a piece of turf with the grass sod upwards, at each angle, the man at the same time that he keeps the children at their work, strikes every piece of turf down level with the surface, by means of a light rammer, such as carpenters use: this finishes the operation, until the time of the turf growing, so as not easily to be disturbed. Then sow a few pounds of white clover, and cow-grass, per acre, with some orchard-grass, and any other permanent grasses suited to the soil. The land is then to be rolled two or three times, to bury the seeds, and bind the land; but if no seeds are sown, the transplanted turf will in two years become a very nice pasture. If a little manure be added, for a year or two after being made, it will turf the better. No kind of cattle, nor sheep, should be allowed to feed the new pasture, until the different grasses have perfected their seeds, when light neat cattle may be turned in, and the grass moderately fed, but not closely down. The great benefit we derive from transplanting turf is, that in two years with proper management, we have a much better pasture, than we could have in thirty years by sowing seeds. If we, [in England,] only sow seeds for permanent pasture, they sometimes do well for a year or two, and then they die away, and the land has no turf worth owning for permanent pasture. I do not mean to say, that all the land in England requires to be transplanted to make permanent pasture; some will turf with sowing seeds, but the greater part will not, to answer any good purpose as pasture land, and it is my decided opinion, that even on

the most kind, and the best lands of England, transplanting of turf will secure the best and most profitable pasture.

I am sincerely yours,

JOHN BLOMFIELD.

[The speedy formation of turf in the United States after grass seeds have been sown, arising from their quick vegetation, and spreading of the roots, does not render the transplanting of sods for pasture of so much consequence here as in England. On some occasions, however, the plan may be found useful, and for this reason the mode of conducting the operation has been given.—Other particulars respecting it, may be found in the Appendix. The plant called cow-grass, is a variety of the common broad-leaved clover, and differs from it in having creeping roots, while those of this last plant are spindle-shaped and fibrous. The leaves, also, are smoother and longer than the common clover. It is highly prized in England as a permanent pasture grass, and is particularly deserving the attention of the American farmer, on account of its suffering less from drought and heat, than most other pasture grasses. It delights in a dry and light soil. The botanical name of the cow-grass is *Trifolium medium;* that of common clover, *Trifolium pratense.* Seeds of the cow-grass may be procured, by addressing a letter to Cormack Son and Sinclair, New Cross nursery, near London.

M.]

On raising Cabbages. By William Coxe.

Burlington, N. J. December 28th, 1819.

Dear Sir,

I SEND you an account of three-quarters of an acre of cabbages raised in the summer of 1819, in the mode recommended in Cobbett's book.

On the 15th April and 3d May the seeds were sown in beds. On the 15th May, 700 of the earliest sown Savoys and late cabbages, were transplanted in squares of four inches. The ground was prepared by ploughing in four feet ridges; it was in good heart; but no manure had been applied either in this or the last season. The severity of the drought delayed the transplanting till the 15th July, a month after the plants were fit to remove. The ridges were wet about two inches deep by a rain which then fell, but not being sufficiently moistened for the use of the dibble, the holes were made by a hoe. On the day after transplanting, all the plants were laid flat by the intense heat of the sun and the dryness of the ground: from this state they were gradually recovered by the heavy dews of the nights. On the 26th July it rained plough-deep, and 250 vacancies out of 3500, were filled with new plants; the ground was then ploughed, by throwing the earth from the plants, and returning it by rather a deeper furrow. Two similar ploughings were given during the season, at distant intervals. Notwithstanding the transplanting was performed at least one month too late, and the drought continued with unusual severity through the whole season, the cabbages grew vigorously, and the greater part formed fine heads.

On the 15th of October, they were first used as food for 19 large hogs and 25 shoats, of three and four months old, which were entirely fed on them (from the failure of the pumpkin crop) for one month, and from that time for another month they supplied abundant food for the shoats. The nourishment from these three-fourths of an acre, besides affording 400 of the best stalks for family winter use, was computed to be equal to several acres of corn or pumpkins. The hogs throve faster on cabbages than on pumpkins, and the labour and expense of cultivation was not greater than an equal space of corn ground would require. The drought, affects the growth of the cabbage less than any plant raised on a farm. There was no superiority observed in the growth of the plants twice transplanted; on the contrary, there was an evident inferiority, possibly owing to the delay in transplanting in expectation of rain, which caused the 700 plants, twice removed, to grow too large before the second transplantation.

Your friend, respectfully,

WM. COXE.

Reuben Haines, esq.

Some Observations on the Hessian Fly; written in the year 1797. *By Dr. Isaac Chapman.*

Read August 14th, 1820.

This insect first appeared in Bucks county in the spring of the year 1786, upon the banks of the Delaware opposite Trenton, having crossed the river from New Jersey, where it had the preceding year destroyed the greatest part of the wheat; but in Bucks not much damage was observed except in a few fields opposite Trenton. After harvest they spread over several townships, and the farmers having sown their wheat the latter end of August and beginning of September, the young plants in two or three weeks after appearing above ground began to die, and when winter came on, instead of the ground being spread over with verdure, as it used to be, in many fields the young plants were nearly all destroyed by the insect.

In 1787 the wheat was, in several townships, the greatest part destroyed. After harvest they spread to a great extent, and did great injury to the young wheat before the frosts appeared.

In 1788, in the beginning of May, and until the 15th or 20th of the same, many fields appeared very promising, but then the growth of the wheat began to be at a stand, and after some days withered and died; many farmers seeing it thus withering away, turned their creatures into the wheat fields, so that at harvest but little had this year come to maturity. After harvest they spread nearly all over the county, and into some parts of the adjacent counties of Philadelphia and Montgomery.

The farmers observing in the two preceding harvests, the wheat that had been sown early in the season to be

more damaged than that sown later, this year generally sowed later in the season than before, and being much discouraged by the crops of the two preceding years failing, put in but little ground with wheat, but chiefly sowed rye, which the fly has as yet damaged very little; and the yellow bearded wheat being introduced, was generally sown on the best grounds well manured. This wheat was brought from Long Island in New York, to which place it was introduced from the southern states, and was said to be proof against the insect, from its having a very hard stalk, and beginning to grow earlier in the spring than that variety they had been accustomed to sow.

1789. The fall and winter of 1788 and spring of 1789, being very favourable, the wheat fields appeared very promising; the insects not doing much damage, except in some low, warm and sheltered situations; and the harvest, though not extraordinary, was good when compared to that of preceding years.

1790. In the autumn of 1789 the wheat was sown very late, and the winter being unfavourable for winter grain, in the spring of 1790 it made a very unpromising appearance, and the yellow bearded wheat was found not to be proof against the insect: the harvests in general were light.

This insect was first discovered on or near Long Island, in the state of New York, from whence they spread rapidly, and was in the year 1797, found west of the Alleghenny mountains. From their apparent progress through the country, they advanced about 30 miles in one summer.

Having so far marked the progress of this insect, and their destructive operations upon the wheat, I will go into a more particular account of them, their economy and destructive process.

Their principal emigrations appear to be after harvest,

in August and the beginning of September. The first year they appear in no great numbers, and scattering; but the next year they advance in great numbers, and, with the increase of those that came the preceding year, make great destruction. It was in the second year of their appearance in my neighbourhood, that I began to be particular in observing them, and from notes taken that and succeeding years, I draw this account.

As this, like most species of flies, undergoes several transformations before they arrive to a perfect state, I now state such observations as I have made upon them in their different stages, until they arrive to the fly.—First, of the egg, then of the larva or caterpillar, then the aurelia or chrysalis, and lastly, when they arrive to the mature state of a fly.

1st. The eggs. These are deposited by the parent fly on the leaf or blade of the wheat, at different times in the spring. The latter end of April and beginning of May, they may be seen laying their eggs on the leaves that have grown that season; they deposit them in the small creases that are longitudinal in the leaf. The egg is scarce discernible with the naked eye, but with a microscope it appears oblong, both ends of the same size, and of a beautiful glossy pale red, a little inclining to yellow. After a few days more, or fewer, as they are warmer or colder, the egg hatches, and the young caterpillar appears.

2d. The larva or caterpillar. It is in this state that the insect does all its mischief: when the caterpillar first appears out of the egg, it retains the pale red colour of the egg, is wrinkled, and has a considerable degree of agility. As soon as hatched it creeps down the leaf until it comes to where it joins the head or main stalk of the plant; if the stalk has advanced much, so that the pedicle of the leaf forms a sheath round the stalk, it enters the

sheath, and continues its course until it reaches the bottom of the sheath; here it fixes to the stalk, if shot up, if not, to the head of the plant where the pedicle of the leaf joins, with its head downwards, and with its teeth it perforates into a sap vessel, from which it draws its nourishment. Having thus placed itself in a proper situation, it never alters its position, until it undergoes the remaining transformations. By the sap it is nourished, its body enlarges, loses its wrinkled appearance, changes to a paler colour, becomes plump and hard, so as to resist the pressure of the stalk and sheath, and as it daily increases in bulk, it presses with such force against the stalk as to print its shape in it, and thus prevents the sap from passing the side of the stalk against which it is fixed. One insect thus placed seldom destroys the plant, but when two or three are fixed in this manner round the stalk or head of a plant, they certainly destroy it; not by the nourishment they draw from the sap, or eating any part of the plant, but by the pressure they make, stopping the ascent of sap, and thus cutting off the nourishment of the plant. They are frequently found in the second sheath from the ground, after the stalk is shot up; but when this is the case, the eggs have been deposited late in the season, and the stalk has acquired such a degree of hardness before the caterpillar begins to press against it, that very little impression is made on the stalk, and little or no damage sustained. And here it may be worth our notice to see how unerring instinct operates on these little animals, scarce visible to the naked eye. The minute they are excluded from the eggs, they are directed to a proper situation, and invariably place themselves with their heads to the root of the plant, that their nourishment may not be cut off in stopping the ascent of the sap, whereby they would perish, as happens to those that are placed uppermost on the stalk when a great num-

ber are found together. Sometimes twenty or thirty are found in the same sheath, the upper ones frequently die for want of sap, and very few thus situated arrived to their proper size.

They continue growing in the caterpillar state between four and five weeks, towards the latter part of which time they change from a light colour to somewhat of a brownish cast, and then to a dark brown, the outward coat of the caterpillar becoming a hard shell or covering for the chrysalis, which change takes place the latter end of May or beginning of June.

3d. The chrysalis state. In this state they receive no nourishment, and continue without any apparent outward alteration about four or five weeks; and in this time the last transformation takes place, and the insect appears in its most perfect state of a fly, which perforates the case of the chrysalis, and makes its appearance in the latter end of July or beginning of August.

4th. The fly is small, has long slender legs, wings long and single, and when they join to the body or thorax, taper almost to a point; towards the other extremity they expand, and at the end form nearly a semicircle; the head and thorax are very small in comparison with the abdomen, which is large, particularly in the females; and when viewed with a microscope, there appear round the abdomen many beautiful circles of a pale red, inclining a little to a yellow colour.

In the last state the insect is very active, moving from place to place with great agility; and in the latter part of August and beginning of September their principal migrations take place: those vegetables on which they deposit their eggs being scarce, they emigrate in search of greater plenty.

They now copulate, and soon after begin to deposit their eggs; and as nearly as I could discover, this pro-

cess is finished by the 15th or 18th of September, though some of them changing from the chrysalis state later than others, will lay their eggs later in proportion.

Now, having traced the insects through one generation, which lasts from the latter end of April, to the 15th or 20th of September, I will carry my remarks through another generation, which being done, I shall have traced them through their various transformation and economy for the period of one year.

From the 1st to the 20th of September the flies are laying their eggs on the leaves of the young wheat, which are in a few days hatched, and the young caterpillars creep down the leaf to its junction with the head of the plant, which is mostly a little below the surface of the ground: here they fix themselves as has been before treated of.

In that situation the caterpillars advance to their full growth, so that when very cold weather begins, they have changed into the chrysalis state, in which they continue during the winter, fixed in the same situation at the head of the young plant; in the spring following perforate the case of the chrysalis, and come forth in the fly state, in April, in the latter end of the same month and beginning of May, as has been before stated: this completes the second generation, which lasts from the middle of September to the beginning of May following.

To plan the periods of their generations and several changes in a clearer point of view, I will in a few words recapitulate what I have before stated.

First generation.

1796. 1st. The eggs were laid the latter end of April, and beginning of May.

2d. In a few days the eggs were hatched, and the young caterpillars appeared in May.

3d. They changed from the caterpillar state the latter end of May and beginning of June ; and

4th. The fly came out of the chrysalis the latter end of July and beginning of August, and deposited their eggs the latter end of August and forepart of September.

Second generation.

1st. The eggs were laid the latter end of August, and in September to the 20th.

2d. In a few days the eggs were hatched, and the caterpillar appeared in September.

3d. They changed from the caterpillar to the chrysalis state in October, in which state they continued the succeeding winter.

1797. 4th. The fly left the chrysalis state, and appeared in the latter end of April and forepart of May.

Having thus marked the progress of these insects through their various transformations and economy for one year, and pointed out the manner in which they destroy the young plants of wheat, from thence we will endeavour to draw some conclusions, whereby we may be led to a remedy to prevent their pernicious effects. These appears to be,

1st. To guard against their destroying the young plants in the autumn.

2d. To guard against their destroying the plants in the spring.

The first intention can be accomplished only, by not sowing until the period of laying their eggs is past, before the young plants appear in leaf.

It appears the flies have generally done laying their eggs by the 20th of September, but as this point is of

the greatest importance, more observations should be made, and it should be determined with the greatest accuracy, as on putting in the grain so early that the plants may have a good root in the autumn, be enabled to stand the winter, and begin to shoot up the stalk early in the spring, depends greatly the succeeding crop: and yet it is necessary that it be sown so late, that the flies cannot deposit their eggs on the leaves, and as this insect appears on many occasions to be endowed with a wonderful degree of instinct, so it appears by this unerring instinct they are directed when is the proper time to deposit their eggs, which I think will be found nearly the same every autumn.

Although I have fixed the 18th or 20th of September as the latest period of depositing their eggs, after which time I think few are laid, we will suppose it the 20th, then if the seed be sown about the 20th, all danger from the insect in the autumn will be avoided, as it will be several days before the young plants will appear above ground.

2d. To guard against their destroying the plants in the spring.

Various things are necessary to be attended to, in order to accomplish this intention.

1st. The state, nature, and situation of the ground.

2d. The variety of seed wheat sown.

3d. The time of sowing.

1st. It is found that wheat sown on ground that is situated low, sheltered, and of a wet quality, is much more damaged than that on land situated higher, more exposed and of a dryer quality; therefore the highest and dryest ground on a farm should be chosen for sowing wheat, and the land should be well cultivated, that the young plants may have a quick growth in the au-

tumn, and thereby be better enabled to stand the winter. If the ground be well manured just before the last ploughing, it will keep the plants warm, and enable them to resist the frost, and make an early growth in the spring; but if laid on much earlier, the putrefactive process which takes place in the dung and generates much warmth, will be nearly over before winter, at which time it is most necessary to cherish the young plants, and enable them to resist the inclemency of the winter frosts.

2d. The variety of wheat.

It is found that nearly all plants removed from a southern latitude to one more northerly, begin to grow earlier in the spring than those plants habited to such northern latitude, to which those of the more southern are removed. From this it may be concluded, that seed wheat brought from the southern states will make an earlier growth than that brought from the northward, which really happens, for the yellow bearded wheat was brought from Maryland to New York, and from thence carried to other parts where the fly appeared. The white Sicilian wheat was likewise from a southern latitude; both which varieties make an earlier growth in the spring than the yellow wheat formerly sown. But much depends on the wheat getting an early growth in the spring, for if the plants have shot up the stalks to the height of eight or ten inches, before the insect appears in the caterpillar state, it is out of danger, the stalk having attained such a degree of hardness that the insect can make little or no impression on it. Therefore it will be better to procure seed wheat from the southern states, and of such varieties as make an early growth in the spring.

3d. The time of sowing.

This is treated under the first head; but as it is a matter of the greatest consequence to determine precisely

the time in the autumn when the flies have all or nearly all deposited their eggs, it requires further and more accurate observation: for if the young plants appear above ground before that time, they will be destroyed, and if the wheat be sown very late, the winter destroys the young plants, or at least so far weakens them, that they make a late growth in the spring, and then fall an easy prey to the insect.

If a number of ingenious persons in different parts of the country could make some experiments expressly to determine this point, it would be doing a very great service, not only to individuals, but to their country in general, for I think this period will be found to be nearly the same in every year. The experiments likely to answer this purpose, would be to sow a few square yards of ground with wheat every second or third day from the first to the twenty-fifth of September, and note particularly the appearance of the insect in each day's sowing, and it might be proper to note the state of the weather between each sowing, &c.

Then experiments might be made with very little trouble; they should be repeated in the same place for two or three years successively, and if they were made in a number of different parts of the country, I think they would determine the matter to a certainty; and that point being clearly ascertained, would in all likelihood, be the means of ensuring to our country annually some millions of bushels of wheat more than, in the present uncertainty of the matter, can be produced.

Wrightstown, Nov. 28th, 1820.

The original of which the foregoing is a transcript, was written in the year 1797. Upwards of twenty years experience has since convinced me that the last three or

four days in September, and first week in October, is the best time for sowing wheat; about which time I have for several years past, been in the practice of sowing, and though a few of the insect in the caterpillar state may appear in the young wheat, they are so few as to do but little injury.

Thy friend,

ISAAC CHAPMAN.

Thomas G. Kennedy, Esq.
Sec. of the Agric. Soc. of Bucks County.

[Mr. Worth of Bucks County, Pennsylvania, says that there are certainly three annual generations of the fly, instead of two as stated by Dr. Chapman, who, he thinks, has "blended the first nd second." The deposit of the eggs for the third generation, according to Mr. Worth, begins about the 15th August, and is carried on till winter. The fly remains in the pupa state during the winter, except in some instances, where it is exposed to a proper degree of warmth, which is the case in the straw about barns. He has found it occasionally from December to March inclusive, about the windows of a room where fire was kept, and he has seen it in the fields, as late as the 25th of November.* Another farmer has seen the fly "quite active, when the ground was hard frozen;" and a third, saw the fly in the very act of depositing its eggs on the 5th of October, in wheat that had been sown on the 14th of the preceding September.† No doubt can therefore be entertained of there being at least three generations of this insect in one year. M.]

* Memoirs of the Penn. Agric. Soc. p. 168, 169, and American Farmer, vol. 3 p. 189.

† American Farmer, vol. 2. p. 235.

Extract of a letter from Thomas G. Kennedy to James P. Morris, chairman of the committee on Fruit and Forest Trees.

Read February 12th, 1821.

The pine and cedar are said to be among the most difficult to grow on being transplanted. Last spring I had wished to plant some pines, but could not conveniently procure any. That my fancy should in some degree have its humour, I procured a few of the common cedar from the woods, and planted them about the usual time of transplanting trees; several of my neighbours predicted that they would not grow, and indeed I found this prediction verified with regard to most of them except six, which I planted in a small enclosed yard, that was shortly afterwards sodded. These all grew finely, and appeared to have suffered but little, if any, from their removal; they were occasionally watered, but not more than those round which there were no sods nor grass growing, and which subsequently perished.

If then the inference that the trees were kept alive, and their growth facilitated, by a degree of moisture being retained about their roots by the covering of sod and grass, which would otherwise have been evaporated by exhalation, be a correct one, may it not furnish a hint by which we may sometimes be saved a good deal of vexation and disappointment, if nothing more. At all events the experiment is an easy one, and it possesses this to recommend it, which unfortunately all experiments do not, *that it costs nothing.*"*

* See Mr. Taylor's mode of planting the Cedar, vol. 1. p. 104.

[I have never found much difficulty in insuring the growth of evergreens; and have always been most successful in spring planting. The cedar grows so plentifully without culture, that it becomes a nuisance. The hemlock spruce I prefer; and have no trouble in its growth or propagation. It has been generally deemed improper and injurious, to suffer sods to remain near the stocks of trees. Stone fruits require open soil, and, whilst young, frequent stirring in the vicinity of the stock. Orchards are much improved by occasional ploughing. Peach orchards, (when they thrive at all) have wonderfully succeeded, when swine root among the trees; and also devour the fallen fruit, with the vermin it contains. Plumbs and other stone fruit are also benefitted in this way. The practice of thus suffering swine unrung, to run at large, is slovenly and disreputable in most instances; but sometimes good comes out of evil.

My *hemlock hedges*, planted in loose ground, some whereof are above eighty years old, are now in perfect vigour. The shears have just done their office on the octogenarians; and have given them verdant, neat, and renovated surfaces. I have hedges from four, five, to twenty-two and eighty years old. No blast, mildew, nor decay in any part, disfigures them. Some cedars, planted among the younger hedges, blot and disgrace them, in winter especially, by their dull and inferior appearance. The *Juniper* preserves its verdure and health; and is the most impervious. It is prickly and close; so that it lacerates the noses and lips of sheep or cattle attempting to penetrate or browse it. See our 1st vol. p. 249, for an account of my hedges.

R. Peters.

July, 1825.]

[Accident, the source of many useful discoveries, taught a friend in Philadelphia county, the proper time to plant out evergreen trees. Some years since, I remarked that many which he put round his house had died, while a row of others were in full vigour. Upon inquiring into the cause of this circumstance, he informed me that those which died, had been transplanted before the commencement of vegetation, while those that lived had been put down, after the sap had ascended. Acting upon the principle of the discovery, he has since always succeeded in causing young evergreen trees to grow, when transplanted. Upon recently admiring the vigorous state of an avenue of young

cedar trees in a shady yard in Philadelphia, and mentioning the above fact, the owner informed me that they had been set out on the 25th of April. My own experience enables me to confirm the fact as to the error of planting out cedar trees early in the spring. In the beginning of April, in the year 1796, I procured from Red Bank in New Jersey, a great number of young cedars, and planted them on the opposite shore in front of the dwelling-house at the Pennsylvania Lazaretto, on State Island, where I then resided, but not one lived, while many other trees put out at the the same time grew well. M.]

Remarks on the late Cattle Procession in Philadelphia, with Directions how to effectually promote the Breed of Cattle. By James Mease, M. D. Vice President of the Philadelphia Society for promoting Agriculture.

Read March 20th, 1821.

Now that the recent "Splendid Show" of fat cattle has passed,* it may be well to reflect upon the exhibition; to examine the justness of the claims it had to the imposing title of its alleged object, and utility; to ask ourselves, whether that object and that end will be in the least promoted by such a procedure first and last, as we have witnessed; and whether there are not other measures more calculated to attain both, and at a much cheaper rate, than those which have been adopted.

The exhibition was entitled "*Pennsylvania against the World.*" Sixty-five oxen, 4 hogs, 19 sheep, 10 kids, 3 deer, and 4 bears, had been kept for different periods at an extra allowance of pasture and short feed, for the purpose of seeing how much flesh and fat could be put on their bodies, and how much fat be made to cover their intestines. The object as alleged, is the "improving the breed of cattle." Let us reflect a moment, and ask, how such an end can be obtained by the measures pursued.

It is apprehended, that it will not be difficult to prove, that the desirable object contemplated will not be effected; that the zeal and spirit of the concerned have been most egregiously misapplied; that the exhibition was calculated to keep up a bad fashion and ruinous

* The cattle were exhibited in stalls in the upper part of the city from the 8th to the 12th March. They were then killed, and their quarters carried about the city in formal procession in carts on the 15th of that month.

practice among graziers, and that a more rational plan must be adopted before the desirable end of the "improvement of the breed of cattle," can be effected.

The same principles which are so well established with regard to the human race, apply with full force to the brute creation. How then, it may be asked, is the form of mankind improved? Is it by long continued overfeeding them, when in the decline of life, to clothe their bodies and line their interiors with loads of fat? What would be thought of a people, who avowed that such means were the best to mend the shapes of a badly formed community? And yet the fashionable practice among graziers with their cattle is not less absurd. Excluding the bears, deers and kids from consideration, let us confine our remarks to cattle, sheep and hogs. A number of large framed oxen with capacious bodies, some of them eight or nine years old, are selected, and after the fullest allowance of the finest pasture, either hired, or given to them to the exclusion of the rest of the stock on the farm, are put up in the winter, and fed at regular hours with as much Indian-corn meal, ground oats, potatoes, pumpkins and hay as they can possibly digest, and until they groan from the oppression they suffer. Their hides are also curried and brushed with as much attention, as is bestowed upon a southern race horse. Sometimes corn meal, and the other articles are given to the animal while at pasture. From one, to even four years of such treatment are required to bring the animal to the "sticking point." Sheep of the New Leicester or Bakewell breed are also selected, for similar experiments. This breed, from its admirable form, is known to take on fat with great ease, and individuals of it, with good pasture, will always in one season become as fat as any reasonable man ought to desire; but by the treatment mentioned, they are so overloaded with fat as

scarcely to be eatable. The same remark is applicable to hogs, some of which, upon the late occasion, were absolutely blind from the projection of fat over their eyes, and required to be raised from their beds of straw to take food. None of them could walk without difficulty. Let us ask how these operations will improve the breed of cattle? Did any of these crammed beasts leave their progeny behind them? The absurdity of naming the object to be effected by this excessive feeding, "the improvement of the breed of cattle," is evident. Where, moreover, is the utility of such overfeeding? If it be said that it furnishes a market for grain and hay, why not apply the extra feed consumed by the show cattle, sheep and hogs, to the fattening thrice the number of head, all of which by it would have been turned off in as excellent order, as is required for human stomachs of ordinary powers of digestion. The difficulty is to find lean enough on the cattle and sheep to eat: as to the hogs, nineteen-twentieths of their weight will be consigned to the manufacturers of soap.*

Any animal however badly shaped, can be made inordinately fat, sooner or later, by extra quantities of nourishing food; but this is not the way to improve the farm-stock of a country. Plain reason and sound sense dictate that what we require, is a breed that will soonest furnish the greatest quantity of good meat or milk at the least expense. It is only in this way, that the advances of the grazier will be returned to him; and it is the quick

* Other bad effects of such public processions are, the loss of work among every class of mechanics, the interruption to the education of the poor, and the temptation to useless expense for strong drink which they excite, at a time, too, when the means of employment are so greatly circumscribed as at present. When this paper was read, many facts in proof were given by different members.

return and circulation of capital that enriches a nation. The money expended, and even lost, by feeding heavy show beef cattle, impoverish more or less a country, by diminishing the means which the feeders would have had without such expenditure, of bringing to market a greater number of cattle in future.

Two methods, and two only, exist by which farm stock can be improved. The first is by breeding from those native individuals of a kind, possessing the forms known to take on most easily flesh and fat; and by occasionally crossing their progeny with others having points in which those resulting from former experiments, may be deficient. If milk be the object, subjects should be selected which yield great quantities of it, and of a good quality, and retain it longest; and crosses may be made with those males within our reach having the best forms and least offal. Materials for such experiments are by no means deficient among us, but unfortunately the spirit for slow improvement does not sufficiently prevail among our intelligent cultivators. In this way a man may in a few years obtain a breed, from which he may live to derive great profit. It is by such methods, that the breeds of England and some parts of the continent of Europe, have been brought to the great perfection which they at present exhibit.

A second and much more expeditious method of improving the breed of cattle, is, by importing such stock from Europe as possess the points to which we wish to direct our attention.

The diffusion of the merino and New Leicester breed of sheep, sets us at ease respecting those inestimable animals. It is to the increase of beef and milk, that the spirited improver should chiefly attend: and fortunately a breed combining both objects is easily attainable, by the importation of the "*improved short-horned cattle*"

from England; a race which, owing to the persevering industry and intelligence of the breeders in the north of England, has reached to as much perfection as can be conceived or desired. Some of this valuable stock are already in the United States. Mr. Williams of Northborough, Massachusetts, has a noble specimen of it, and several of his descendants are in the vicinity of Philadelphia, in the possession of a gentleman animated with the true spirit of improvement, and who formed his judgment on this subject from an attentive examination of the best specimens of the stock in England, and by comparing them with other breeds. Two arrived in Philadelphia about three years since, on their way to Kentucky, where they brought one thousand dollars a piece at public auction. A son of the famous Comet, which sold for one thousand guineas, at the sale of Mr. Colling's cattle, in England, is at New Brunswick, New Jersey: but if every county in every state had a pair of them, the nation could not be soon overstocked. An inspection of the animals alluded to, would convince any one acquainted with the good points of stock, how far the short-horned breed is superior to all others hitherto introduced into the United States, in the great objects of size and form. But as it is in the power of few to enjoy such gratifying sights, some particulars shall be given, to show the grounds upon which our praises are bestowed. Mr. Charles Champion, of Blyth, near Bawtry, Nottinghamshire, England, writes to me as follows: "You mention the weights of several oxen which have been slaughtered in America, but as you have not stated their ages, I suppose they must have been six or seven years old.* Their weights were certainly great, but in England we do not consider those overgrown animals the most profitable. Our lands are generally so highly rented, and the

* Mr. Champion was right in his conjecture.

poor rates and taxes so exceedingly burdensome to the farmers, as to call forth their best exertions, and it becomes his interest to select that breed of cattle which will make the quickest and most profitable return for the food they consume. For these objects, no breed is so eminently distinguished as the *improved short-horns:* their early maturity being a fact now so well established, that they are spreading in every direction, both in England and Ireland. It has been my practice for some years to feed my steers, and sell them to the butcher from two up to three years old, when they generally average 70 stone of 14 lbs. (980 lbs.) with 10 stones (140 lbs.) of loose tallow. I sold a steer by Blyth Comet in May, 1817, at Blyth fair, for 36*l.* weighing 72 stones (1008 lbs. and he was only 22 months old. At my sale the other day (January 28th, 1820,) I sold a steer to Mr. Arnsby, which is now two years and ten months old, and would weigh if killed, 105 stones, (1470 lbs.) This steer is by Blyth Comet. In November, 1812, my turnips having failed, I sold ten young steers, all of my own breeding, to my brother, who fed them in an open yard, without a shed to go under, upon Swedish turnips and straw, without any other food, except a small quantity of clover hay, once a day, for about a month before he sold them. The price I obtained for the steers in November, was 17*l.* each, being at the time a full market price, and my brother sold them for 39*l.* 10*s.* each, leaving 22*l.* 10*s.* each for five months keeping."

Mr. Champion has presented to the Philadelphia Society for promoting Agriculture, a finely engraved portrait of a steer raised by him, from a painting he had taken a few days before it left Blyth for London. This print is hung up in the room of the Society, and cannot fail to draw forth expressions of admiration from every judge of cattle. The weight of the four quarters, as set

down on the corner of the print, is 178 stones, which at 8 lbs. to the London stone, make 1424 lbs. The tallow weighed 199 lbs. A bull three years and two months old, of the same breed (the short-horned) but from a different stock, weighed alive 160 stones (2240 lbs. :) and his four quarters were laid at 1540 lbs. : six steers, three years and six months old, weighed, the four quarters, 94 stones each (1316 lbs.) Their tallow weighed from nine to ten stone each, (126—140 lbs.) These cattle belonged to Mr. John Nicholson of Gipton, near Leeds, Yorkshire.* What weights would such stock reach, if they could have the advantage of Indian corn?"†

When the intelligent American grazier calculates the difference between the profit of feeding an animal, which, say at three years old, will reach these weights of flesh and flat; and reflects on the loss commonly sustained by feeding another, six or eight years old, for a much longer period, in order to make him equal in weight, he cannot for a moment hesitate to make up his mind on the superior advantage to be derived from the short-horned breed.‡

* See Mr. N's letter to the Author; Archives of Useful Knowledge, vol. 1. p. 295. 1810.

† The value set upon the "*improved short-horned breed of cattle,*" may be judged of from the prices they bring at auction. At a sale of the stock of Robert Collings of Bampton Co. Durham, Sept. 1818, 61 lots of cattle and sheep brought 9496*l.* 4*s.* sterling—the cattle sold for 7852*l.* 19*s.* At Mr Champion's sale at Blyth, Jan. 1820, twenty head averaged 38 guineas and 3-5th each. See American Farmer, vol. 2, p. 179.

‡ There can be no difficulty in procuring a pair of these inestimable cattle. A letter directed to Mr. Champion would soon reach him, and on being satisfied as to the lodgment of funds in London, would doubtless make all the necessary arrangements for the safety and sustenance of the stock, during the voyage. A man must accompany the animals to take care of them on shipboard. Twelve hundred dollars would cover all expenses for a pair, insurance included.

The importation of a pair of them is therefore urgently suggested to the spirited American grazier. The expense will soon be repaid; for the reputation of the breed which will precede their arrival, and much more, the sight of the animals, will create an anxiety in our farmers, who are quick in discerning sources of profitable investment, to possess themselves of it. The great prices given for merino sheep during the late war with England, and for the mere use of a new Leicester tup, before that event, and while the full blood was confined to one man, afforded ample proof that farmers do not hesitate to risk high prices for stock, when a reasonable probability exists of obtaining quickly an interest for capital advanced:* and when we reflect that the amount of the losses sustained by those concerned in preparing the objects for the late show, and of two former similar exhibitions, would be much more than sufficient to secure to Pennsylvania a pair of the breed of cattle in question, it is to be regretted that so much money should have been thrown away, without producing any permanent benefit to the country. Our farmers reflecting, that by crossing the best of their own stock, or the best they could procure, with the foreign breed, they secure a portion of a distinctive, strongly marked race, the characters and valuable properties of which would certainly increase as they advanced in the blood, will be led to make the experiment, and the gratification derived from the thriving disposition and beauty of form, exhibited in the progeny shortly after their appearance on their farms, would stimulate them to its repetition: and when, after a few years they found that the new breed furnished

* From $100 to $500 were given for a merino tup: and $150 and $200, were paid by several for the use of a new Leicester tup, to captain Farmer, of New Brunswick, New Jersey, for one season.

more and richer beef, at a much earlier age, and with less feed than is commonly required for native stock; and richer milk, and better working oxen than any they before had, their minds will be made up as to the exclusion of all other breeds of horned cattle from their farms. But this is not all; their stock will be viewed by their less enterprising and more cautious neighbours: motives of interest and self satisfaction derived from the treasure in possession, will excite the owner to diffuse a knowledge of its value, which will be every year more and more enhanced, and the demand for it be enlarged, from the increasing numbers annually engaging in the agricultural life. Hence a source of revenue will be secured to himself and family.

The peculiar marks which designate this breed from all others, are, capacious barrel shaped bodies, straight backs, broad loins, small neck and head, full chines, leaving no hollows behind the shoulders, clean chaps, bright and prominent eyes, deep chests projecting well before the legs: *fore legs clean, straight, and standing wide;* not knock-kneed (or in-kneed,) wide hips and round; rump lying in a horizontal direction, not sinking backwards; the tail set on so high as to take in the same line with the back, and lastly, small bones. A portrait of a bull of this breed, may be seen in the "Archives of Useful Knowledge, vol. i. p. 358," and plates of several more, and of cows of the same breed, in "*Tuke's Survey of Yorkshire.*"

There is another breed of cattle, the Scotch, or Kyloes, well deserving the attention of the American improver, on account of their extreme hardy constitution, and tendency to early fatting on grass alone; and of their filling up a vacancy in the supply of good beef about August and September, a time, when the heavy cattle of the preceding season have all been killed off, and the stock of

the season have not come in. Repeated experiments with the Kyloes in England, have shown that in one summer, at four years old, they will reach from 500 to 700 lbs. weight, with from 70 to 90 lbs. loose fat.

The great misfortune has hitherto been in the United States, as respects cattle, that, although within the last 30 years, they have greatly improved in form, owing to judicious crosses between native stock, and occasionally with foreign breeds that were introduced, yet no blood has been kept so pure, as to enable any one to say he possessed a race with characters so strongly marked, as would insure their transmission to his or her descendants. Our whole procedure in this business, has been a system of chance, and this want of certainty in our crosses has been one reason why so few have hesitated to accept of a high price for a thriving calf, which, had it been raised, might have proved the origin of a valuable breed. It is full time to begin to conduct our operations upon fixed principles, and no time could be more propitious than the present, when a spirit of improvement, which the friends to agriculture have been striving for many years to excite, is diffused through the United States, and when foreign commerce has ceased to offer those allurements, which so powerfully attracted our citizens, and drew off their attention from internal objects.

[The foregoing paper was published by order of the Society, a few days after it was read, in the National Recorder of Philadelphia, whence it was transferred to the newspapers in Pennsylvania, and the other states. The author feels happy in thinking, that it has been instrumental in directing the attention of the improvers of stock to "the improved short-horns," and to the fine breed of Mr. Champion, several of which have since been imported into different states. Mr. Skinner of Baltimore set the example, by importing a bull and two heifers in May, 1822, which were immediately sold to Mr. Lloyd of Wye River, Maryland. They cost about $1500. M.]

On Dissection of a horse, whose death was occasioned by the perforation of the Aorta by worms. By Richard Harlan, M. D.

Philadelphia, March 25th, 1822.

Gentlemen,

I THIS day received through the politeness of my friend R. Haines, of Germantown, the body of a colt one year old, which died suddenly on the morning of the 24th inst.

I proceeded immediately to the dissection, assisted by Dr. Lawrence. We first examined the brain, which we found healthy; though there was serous effusion within the sheath of the *Medulla Spinalis*.

On opening the abdomen, we were surprised by the effusion, of at least, two buckets full of fluid black blood: this excited my attention, as I had before met with a similar case, where the cause of the mischief had not been investigated.

Continuing the dissection, we came to an immense tumour, lying over the right kidney, occupying the whole of the right lumbar and iliac regions, and which was filled with grumous, coagulated blood. On removing this, we found the sack confusedly connected to the mesentery, the aorta, and surrounding parts. We next dissected away the aorta abdominalis, above and below the sack, and on opening the artery, we observed the internal coat near that portion, which gives off the mesenteric artery, much diseased, and considerably enlarged;—the superior mesenteric artery was particularly enlarged; the internal coat, both of the mesenteric and of the aorta, for several inches being nearly destroyed, and of a black colour. On examining more minutely the portion of the aorta below the tumour, we discovered the cause of the

whole mischief, viz *a great number of small worms*, from a quarter to three quarters of an inch in length, attached to the internal coat of this portion of the artery; giving it truly a *worm eaten* appearance. The worms, on examination, by Mr. Thomas Say, proved to be an intestinal species, common in the horse: they must therefore have eaten their way, from the small intestines of the animal, into the mesenteric artery; from whence they continued their course to the aorta, destroying as they proceeded, the internal coat. As their presence in this unnatural situation produced inflammation, coagulated lymph was thrown out between them and the current of blood, by which they became in a manner incisted.

The artery became enlarged by their irritation, and formed a species of aneurism; particularly of the mesenteric artery, which eventually burst suddenly, after the animal had eaten a full meal, and produced immediate death, the usual termination of such cases.

I beg the Society to accept of the specimens of the parisitical animals accompanying this communication. The artery is dissected and prepared (to be placed in my Museum) in which many of the worms are left in their situation on the interior of the aorta.

The following description of the worm is extracted from *Cuvier*. Regne animal, vol. IV. p. 34.

Description.

Le strongle du Cheval. Strongylas armatus. (Rudolphi.)

7.—15.* long du deux pouces, à tête sphérique dure,

* Two inches long; an hard spherical head; its mouth furnished all round with little soft prickles; the coat or skin of the male separated into three leaves, or folds.

This is the most common of the horse-worms. It penetrates as far as the arteries, where it occasions aneurisms. We find it also in the ass, and the mule.

à bouche garnie tout autour de petites épines molles ; la bourse du mâle devisée en trois feuillets.

C'est le plus commun des vers du cheval, il pènètre jusque dans les artères, ou il occasionne des aneurismes. —On le trouve aussi dans l'âne, et le mulet.

Books of Farriery do not state whether cattle of any description are liable to this disease.

Vide Boardman's Veterinary Dictionary. *Article Aneurism.*

I am, very respectfully,

RICHARD HARLAN, M. D.
Professor of Comp. Anat.
Philad. Museum, &c.

Philad. Soc. for promoting Agriculture.

[In a note, page 83 of our 3d volume, I suggested, that doubtful and unknown diseases in animals (man included) should be treated as originating from *worms.* If other remedies be used, vermifuges, in addition, should also be administered. Before and since this suggestion, I have been confirmed in this opinion. It has been my habit, (and so it should be with every farmer) to cause to be dissected every animal dying with disease on my farm. In the greatest number of these victims, worms have been discovered of various descriptions. Some of them like those mentioned by Dr. Harlan. It would seem that every region of the intestines had some peculiar foe. This, and a thousand other misfortunes occurring to our domestic animals, loudly impress the indispensable usefulness of veterinary knowledge. Whilst we are laudably endeavouring to improve the breed of our stock, it is lamentable indeed, that so little has been done to save them from destruction. Among the most respectable professional men in Europe, comparative anatomy, and all veterinary knowledge, is highly creditable. But with us, the diseases of our animals are left to ignorant pretenders, for their cure or prevention. Many years have passed away since our Society, and myself individually, have warmly and feelingly recommended a

veterinary institution, and that it should be part of the education of medical men, to know how to treat the diseases of the animals composing our stock. Let this part of the acquirements necessary for those who practice in the country, be rescued from the low state in which it now is; by being made essential to the education of medical men; and countless advantages will accrue to our farmers and breeders of stock. It is vain to raise valuable animals, without ensuring (so far as human means can accomplish it,) their safety, when attacked by diseases, or injured by accidents too frequently occurring; and often fatal through the want of skill in their treatment. R. P.]

A new mode of setting Post and Rail Fences. By Isaac Conard.

Lampeter Township, Lancaster Co. (Penn.)
1st mo. (Jan.) 27th, 1823.

Respected Friend,

HAVING been informed by my friend William Buckley, that thou desired to have an account and model of my new mode of fencing, I herewith send a model of two pannels. The process of setting the fence up is as follows:—First, fix flat stones on the spots where the posts are to stand. Secondly, set the posts on them, and put in the rails. Thirdly, fix on the spots for the holes in which the ends of the stakes are to stand, and dig the holes. Fourthly, fix the stakes, holding them at first, in a horizontal position, while the pins are driven in; then press the stakes down, until they pinch hard on the rail next below them, to prevent the bottom of the post from moving off the stone. The stakes are to be set about one foot in the ground. Fifthly, place the earth round the bottom of the stake, and pound it hard.

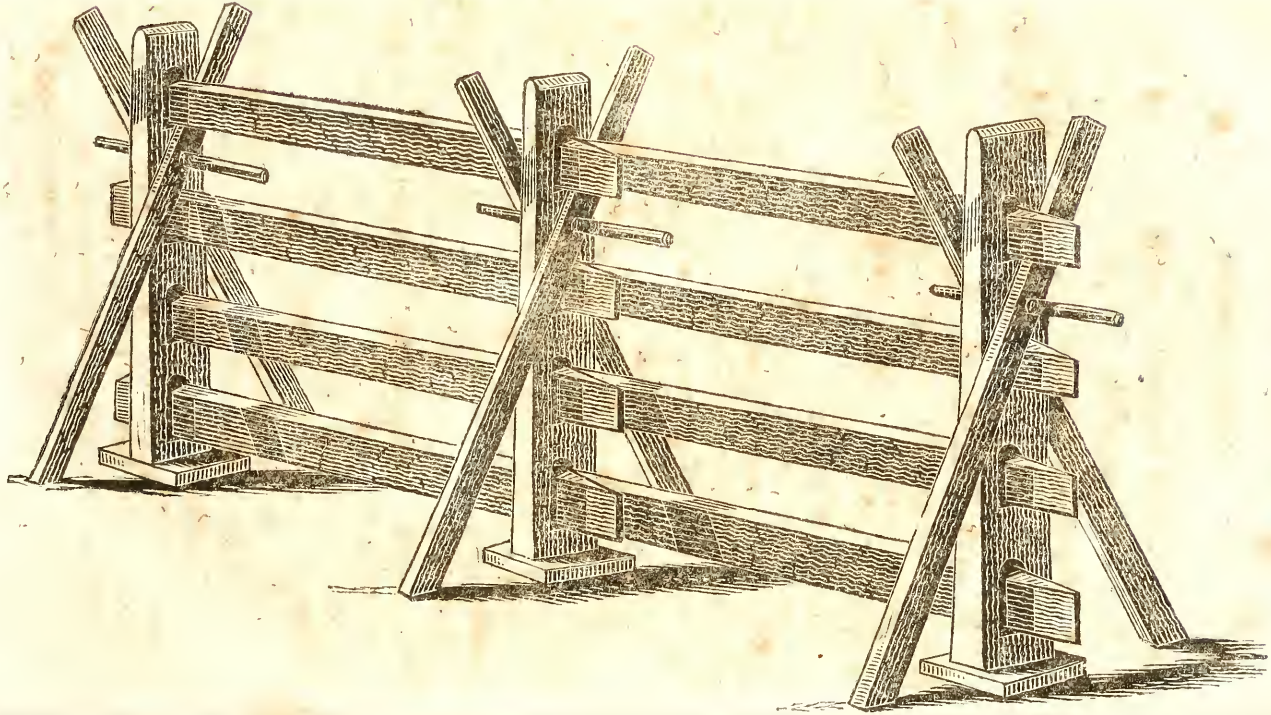
Three years since, I made about sixty pannels of fence after the manner just described, and although they have been much exposed to horses, cattle, and swine, they stand as straight as when first made. The posts were made of such twisted timber, that they could not have been split into fire-wood. I have since put up a quantity of fence, made out of old posts that had rotted off at the surface. By leaving the stakes long enough to admit of a second hole being made in them, they can easily be taken off when they rot at the surface, and may then be re-set without disturbing the fence.

I am, with sincere respect,

ISAAC CONARD.

Dr. James Mease.

ISAAC CONARD'S FENCE.



On the cultivation of Lucerne. By John Patrick.

Perth Amboy, N. J. July 10th, 1823.

HAVING been for eight or ten years past, in the successful practice of cultivating Lucerne, I think it may promote the interests of agriculture, to offer you a few remarks on that subject.

This article I have found by experience, to be not only the most convenient, but also the most profitable of all grasses. It vegetates quicker in the spring than any other grass; it resists the effects of droughts; it may be cut four or five times in, the course of the season; and it will endure from ten to twelve years without renewing. Of all the grasses it is the most profitable for soiling. I am fully of opinion, that one acre properly got in, would be more than sufficient to maintain at least six head of cattle, from 1st May, until the frosts set in; for before it can be cut down in this way, the first part of it will again be ready for the scythe. English writers have recommended the drill system for this grass, but in this climate I have found this plan not to answer. The proper mode is to put the land in good order; and to sow it broad cast during the month of April, or the early part of May. Fall sowing will not answer, as when sowed so late, it, like clover, is found not to resist the effects of the frosts. It may be sown either by itself, or with spring rye, or barley, or with oats, but in the last case, the oats would require to be cut green, and before the seeds form, and by this means an early feed for cattle would be obtained without impoverishing the soil. But the mode I would most confidently recommend, would

be, to sow with the Lucerne about half a bushel of winter rye to the acre. The effect of this is, that the rye, which vegetates quickly, serves as a protection to the young grass, against the effects of the scorching sun, and by the time the grass attains sufficient strength to protect itself, the rye withers, and apparently dies. It will however again come forth in the spring, and mixed with the Lucerne, will add much to the quantity of fodder, and prove a most excellent feed for cattle. The rye will admit of being cut green in this way, (before getting into seed) two or three times with the Lucerne, before it decays. The quantity of seed I recommend, is at the rate of from 15 to 20 lbs. to the acre.

The kind of soil most suitable for this culture is a *dry* mellow loam, but a sandy or clay loam will also answer, *provided they are not wet.* In a favourable season, the Lucerne may be cut the ensuing fall, after the first season. You may generally begin to cut it green for cattle by the first of May, which saves the young pasture, and is in every respect a great convenience, as hogs and every description of animals devour it with equal avidity. It produces a great quantity of seed, and is much more easily obtained than clover. The second and third crops are the most productive of seed.

JOHN PATRICK.

Philad. Soc. for promoting Agriculture.

On covered earth as a Manure. By Wm. Webb.

Read November 18th, 1823.

It is a matter of great importance to the farmer, to obtain an additional substance with which to enrich his land, especially since plaster sometimes fails to produce the effect it formerly did. The want of wood to burn lime with some persons, and the want of lime stone with others, prevent lime from being used by all. Stable manure is then the only resource many farmers have, to depend on, to make their land productive.

The luxuriant vegetation that generally appeared in 1823, has been remarked by many for producing extraordinary crops of grass and grain, particularly of Indian corn. For this luxuriance, a better reason, perhaps, cannot be assigned, than that of the great drought there was in the preceding year. During the long continuance of the dry weather, it is believed, that the earth imbibed from the atmosphere a large supply of food for vegetables. The writer is acquainted with two cases where earth which had been long sheltered from rain, was put on land, more for the purpose of getting it out of the way, than for any prospect of its fertilising property, which produced great fertility; in one case, for ten or twelve years; the other case is in the third or fourth year of its operation. In England, it is said, that earth obtained by pulverising the walls of decayed clay cottages, and put on land, as a top dressing, is very fertilising. These circumstances are scarcely sufficient to induce some farmer to make a trial on a small scale, by putting some ground under cover, least exposed to the air, where it should remain some time. By keeping an account of

the cost, and comparing the expense with the effect produced as a manure, the farmer would be enabled to decide whether it would be profitable to adopt such a plan to enrich his land or not.

[Plaster shews, with me, no signs of failure. Nor will it with any other, when properly treated.

It is well known to those who have collected the materials for producing salt petre, that old mud walls, earth thrown up in covered ridges; that found in cellars, under old buildings, and other places not subject to rains and floods; are impregnated with nitre abundantly. This salt is found in caves in our western country, to a great extent. No doubt the earth mentioned in the foregoing communication was thus rendered fertile. But the mixture of soil produces wonderful effects, even where no such impregnation occurs. Instances could be given in numerous cases. A member of this Society, (John Curwen, Esq) many years ago levelled an almost barren hill, adjacent to a piece of bottom land, which had heretofore produced only coarse and worthless herbage; but by hauling and spreading over the soil from the hill, the bottom land was converted into a most profitable meadow; which threw up luxuriant crops of the best grass—the green grass (poa viridis,) &c.; without any other manure or auxiliary. To me this was not surprising, for I have experienced the like effects often.

During the revolutionary war, and especially at its commencement, necessity compelled our searching for nitre in every way and place. I was often surprised by finding it where it was least expected. In dry sheltered earth, thrown up in ridges covered by sheds; in the sites of dilapidated buildings; dry cellars, stables and barns, and frequently in caves, and such depositories. Common earth, thrown up in ridges and sheltered from rain, lying for months exposed to the influences of the air, would be impregnated. We had not then access to the stores of this article now common in western caves. Nor did we then dream of possessing a country which affords ample stores of materials for war, as well as for the arts of peace. A spot covered by an old pile of lumber,—even by a single board—that under a brush heap long neglected—will become strikingly fertile. See our 1st vol. p. 329, 330.

R. Peters.]

[The fertilising property of earth taken from pits, wells, or cellars, or that has been for some time kept covered, has long been known. Mr. Bordley mentions that ground sheltered by a temporary fodder house 300 feet long and 20 broad, for six months, (October to April) shewed marks of richness during the five following years, greatly superior to the adjoining land on which cattle had been foddered for some time. In another instance clay was turned out from four feet in depth in digging a cellar, and two years afterwards the hillocks as formed in turning the clay out of barrows, were sowed with melon, cucumber and squash seeds, and excellent crops produced.* Col. Forrest of Philad. Co. found a cover of earth from the floor of a green-house, greatly to promote the growth and production of a decaying strawberry-bed, and his experience has since been confirmed by others.† An explanation of the fact could be given, on chemical principles, but it may probably be sufficient in a work intended for the use of the practical farmer, to mention a source of manure of which he may often avail himself; as when removing an old house, an old log or frame barn, or hay barracks. I have seen with regret upon such occasions, the first two spade-depths carted away, instead of being drawn into the barn yard, or put upon a worn out piece of land; and this too, by men who had no resource of maintenance except the produce of their farms. M.]

* Essays and notes on Husbandry and Rural Affairs, p. 148. 272. Philad. 1799.

† See the particulars in Conrad's Agricultural Almanac of Philadelphia, for the year 1824.

On plaster of Paris. By William Darlington, M. D.

West Chester, Penn. June 12th, 1824.

Dear Sir,

Your letter dated May 4th, requesting some information respecting the use of *Plaster of Paris*, in this neighbourhood, I had the honour to receive on the 11th of last month; and have thus long delayed my answer, with a view to collect what information I could from some of our most intelligent and successful practical farmers. I have occasionally, within a few years past, heard some of our farmers remark, that they thought the plaster had failed to produce its usual good effect; and that they had, consequently, been induced to omit the use of it. An excellent farmer assured me, the other day, that on a farm which he purchased four or five years since, (and on the greater portion of which plaster had previously been used) he commenced by a free use of the plaster, leaving strips of the fields unsown, in order to test it; but that he could not perceive the slightest benefit from it. The following year he applied about half the quantity, with the same result. This discouraged him so much that he abandoned it. However, he added that last year he had applied the plaster on a field which had been kept as an apple orchard for a number of years, and on which no plaster had been previously used. Having cut off the trees, and, by our usual rotation of crops, (Indian corn, barley, and wheat in succession,) got the field in with clover, he found that the plaster produced

the same signal effect which it had done, when first introduced. This was clearly evinced by the circumstance of a half-land having been accidentally missed, in sowing the plaster; and I had myself the pleasure of witnessing the contrast which it exhibited. This fact would seem to sustain the idea that a continued use of plaster, without some suitable change in the mode of culture, will ultimately fail in producing a beneficial effect. Possibly it may have been owing to the cause suggested in your letter, viz. the failure of the clover, or the land becoming *clover sick*, and not to the demerit of the plaster. It has, however, been remarked to me, by a farmer who has constantly used, and still has a high opinion of plaster, that the high state of improvement in many of the farms of this vicinity may probably be one reason why the effects of plaster are not so signal as when it was first introduced. Certain it is, that our best farmers have now, for the most part, fine crops of clover, &c. even when the plaster is omitted; and therefore, the difference, on using it, is necessarily less striking than formerly. I may nevertheless state, that our most observing and intelligent farmers are still in the practice of using the plaster, under the conviction that it is a valuable application: and that some, who omitted it for a short time, found their clover crops deteriorating so sensibly, from the want of it, they have returned to the use of it with renewed confidence, and decided advantage. *Lime* is now very extensively used in all this part of the country, and with the most admirable effect, either at the time of planting Indian corn, (mixing it with the mould,) which is the prevailing practice,—or as a *top dressing*, on pasture and mowing grounds; which latter, as far as my limited experience extends, is even a preferable mode of application. It is the opinion of many, that

after a proper dressing of lime, under our system of rotation in crops, the gypsum has a *renewed* efficacy in promoting vegetation,—though it may be difficult to determine how much of the benefit may be owing to the lime. Plaster was formerly used with surprising effect upon *Indian corn;* but, at present, I can only say that I tried an experiment with it two years ago, by plastering alternate rows throughout a small field, without any discernible advantage from it. It may be proper to remark, that the season (1822,) was one of unusual drought. I have this year renewed the experiment, in part; the result of which remains to be seen.

On the whole, I think I may safely assure you, that although some few of our farmers have discontinued the use of plaster, from an apprehension that it has lost its effect, by repetition,—yet that it is generally used by our most successful agriculturalists; and is still esteemed by them as a highly valuable auxiliary in the culture of red clover. It is true that the attention of *all* is more especially directed to the use of *lime*, at this time; but I believe there is no doubt that, with judicious management, gypsum will be enabled to sustain the reputation which it formerly, and deservedly, possessed.

I am well aware that to an agriculturalist of your science, and long experience, these desultory observations, hastily collected, must appear extremely defective and unsatisfactory; but I could not deny myself the pleasure of attempting an answer, imperfect as it is, to the inquiries which you did me the honour to direct to me. I have recently become a practical farmer myself, on a small scale; and take a lively interest in whatever concerns the prosperity of that noble and delightful occupation. I trust the day is not far distant, when a proper knowledge, and application of the auxiliary sciences, will

enable our American farmers to surmount many of their greatest apparent difficulties,—and what is not less important, to discard their absurd and pernicious prejudices.

With the highest respect,

WM. DARLINGTON.

Hon. Judge Peters.

Belmont, June 26th, 1824.

Dear Sir,

I THANK you very much for your attention to my request, in relation to the practice of applying plaster of Paris. Being an *Octogenarian*, I have considerably intermitted, but can never abandon, my desire to promote the leading interest of my country. I despise adhering to an *old* opinion, (or any opinion) merely because I had promulgated it. But when long convinced of its soundness, I do not lightly banish it. In my first trials, and in the little tract I published, I entertained the same sentiments respecting it, I now hold;—to wit, that after it had exhausted the inert vegetable matter it finds in the earth, a new supply either of vegetable, or animal, substances must be afforded. Neither plaster, *per se*, nor lime, is manure. Its composition is well known; and the greatest proportion is *sulphuric acid;* which sets into activity, the substances proper for its operation. Sir H. Davy's notion, that it operated on plants, or in the earth, only where gypsum was found, I never did agree in; much as I admire his chemical science. Nor do I consider his trifling experiments on a plateful of minced veal, a sufficient refutation of my long experience, that it will decompose both animal and vegetable substances. See our 3d vol. p. 296. 235, &c.

If I wanted a strong proof of its failure after the vegetable matter was exhausted, or its efficacy when that matter was in plenty; I could not be furnished with one more in proof, than that of the farmer you mention. In his orchard, the magazine for setting the plaster at work, were found in profusion; as is always the case in old, and even weedy fields. In the other parts of his farm, it wanted the indispensable *pabulum;* and had also to encounter the decadency of the clover, which, sooner or later, on the best cultivated fields, will occur. The observation that the contrast in highly improved land, is certainly less discernible, than it can be in soil of the the contrary description, is reasonable. The first requires less plaster; but a bushel to the acre, will always do good. I say *always;* but I am still consistent in my original assertions,—that its non-appearance in some seasons, is not to be taken as a *general* objection; for I mention *facts* to shew, that it has laid torpid, for one, two, and three years; and has afterwards operated vigorously. *Perseverando* has been my motto; and, with the auxiliaries I have mentioned, I can truly say, I have never found reason to alter my first opinions. I have known it fail on Indian corn plants; and have seen the spots where the corn had been, several years thereafter, throw up spontaneous growths of luxuriant clover. If in repeatedly *plastered* fields its efficacy is lost, on *limed* lands its inefficacy is as often perceivable. Nothing is more mischievous than a too frequent or profuse application of *lime.* We cannot account for every thing we see; although, in the pride of human reason, we aim at impracticable flights, whilst we endeavour to explain inexplicable things.

Accept my respects,

R. Peters.

Dr. William Darlington.

On plaster of Paris. By Abiel Jenners.

Near Waterford, Loudon Co. Vir. June 15th, 1824.

Dear Sir,

On Monday the 13th our newly established Agricultural Society met, according to appointment, and whilst in session, our president, Mr. C. Powel, took from his pocket, a letter from your honour, and read it to us, and the pleasure it afforded me to once more hear from a man of your age, experience, and great practical knowledge in farming generally, induces me to take the liberty to address you, to let you know how highly we esteem your character and every thing we catch from your able pen. I am one of the number who answered your queries in the summer of 1810, through Mr. W. Noland, and have your work of that year on the subject of plaster (as we call it,) which work I prize highly. Your letter to M. Powel being on the same subject, although we ordered it printed, I have not yet got the particulars of, nor heard it read but once. I still remember the general subject, being in answer to his letter to you, requesting of you to let him know if the plaster had lost its effect, in the circle of your observation or knowledge, and I am very happy to find that you still have reason to believe in its usefulness. I have heard a number of my acquaintance say of late, that the plaster has done,—I will buy no more; I have invariably replied by saying, that it has done in a great measure until we can get the clover to stand, but whilst we work at least 2-5ths of our lands in a season, and many are half in corn, and fallow, and get no clover to stand, we may expect the plaster and every thing else to fail.

The spring of 1821 and 1822, I sowed clover largely, and as thick as my neighbours did; and the seasons were so extremely dry we lost it all; but the clover sowed in 1823, and this year, has stood extremely well. I never saw finer clover fields since I lived in this country, which has been from 1802; and although we had generally bare fields to fallow last summer, the clover being killed the year before by drought, yet I never have seen the wheat crops appear better for these twenty years, and in fact every thing now looks as promising as ever I saw it. I have never lost my faith in the plaster, and it is now as strong as ever. I know it makes the clover grow uncommonly well the second year, if we can get it to stand the first. I know of nothing that creates vegetable matter like clover and plaster; and this substance when once got into the land, makes every thing grow uncommonly well that we put into it. The ploughing large crops of dead clover in August, for a fallow crop of wheat, has, in a number of cases, in this country, almost ruined the crops of wheat, whilst fields of clover adjoining, pretty closely fed down through the summer, have had good crops. How is this to be accounted for? I have seen no written observations on the subject, but have thought that the reason was, that the clover being so hard to rot, the putrefaction was not far enough advanced in the fall nor early in the spring, for the vegetable matter to be in a proper state to feed the wheat. And another reason is, that it keeps the land too open, and loose, for wheat to grow well; for I always notice that wheat grows best where the land is tight, or hard, in the spring, if clean. But here I am staggered again, for a friend of mine told me last week, that Mr. John Taylor, of Caroline county, in this State, wrote a statement, which he saw; giving an account of his ploughing a slip in June, when in bloom, and another slip along side, when dead, and all sowed

in one day; and that the last ploughing of dead clover, produced double the wheat the other did May it not be owing to his clover not being near as large as ours, and his land of a more adhesive quality? Your observations on this subject will be very gratefully received. I have been mowing the clover on the rankest parts of my fields, to be fallowed, and spreading what I cut off them on poor hills, as I have plenty of hay on other parts of my farm; the object is to keep it green until I plough.

Very respectfully,

ABIEL JENNERS.

Richard Peters, Esq.

Belmont, June 27th, 1824.

Dear Sir,

No apology is necessary for your inquiries in relation to the clover husbandry. Although I have intermitted my practical pursuits, in a great degree; yet I am constantly desirous of doing all the service in my power, to those who are more active than my stage of life permits me to be. I am endeavouring to collect, from some of our Pennsylvania farmers, actual *facts;* and not wavering or ill founded opinions, on the subject; and I think I shall establish the correctness of the account given from the beginning, of the qualities and powers of the plaster: so as to shew that it is the improvident use of it, and the overweening reliance on it, exclusive of those auxiliaries it requires, which have brought it into disrepute with many farmers; not only in your country, but in other parts of our Union. Scientific discussions as to its composition and qualities, are understood by few; and even *they* differ about its operation. There is however no doubt as to the component parts of it. But in what manner, or by

what means, its own decomposition is effected; so as to let loose its operative parts, that they may act on the substances promotive of vegetation; are subjects of difference and speculation. Many of the *causes* of effects, we see in this and other substances, are hidden among the arcana of nature. We shall therefore find it more satisfactory to make accurate observations on *effects;* and thus trace, as decisively as necessary for practical men to know, the immediate causes producing such effects. Now we always perceive, that, on the first application of plaster to *old* fields, the effect is wonderful. We know that, in such fields, decayed and decaying vegetable, and often animal, matter, is abundant. Is it then not reasonable to suppose, that the inert vegetable matter, which is chiefly the component part of the surface or super stratum of such fields; is the pabulum for the plaster? And that when this is exhausted it must be renewed?—It is in vain to say, that, in newly cleared land, where vegetable matter profusely abounds; plaster shews little or no effect. Nature in its prime needs no artificial auxiliary. Like the poet's description of female beauty, which "needs not the foreign aid of ornament;" it has fertility enough in itself; and indeed often requires *checks*, more than *stimulants*. Nor is it an argument against this view of the subject, that, on lands in high culture by dung, &c. strips plastered, and those to which gypsum has not been applied, shew little, if any difference. The fertility of such lands is equalised and ample; and no additional stimulant is necessary. Over-dunged soils, (seldom occurring) are over luxuriant; and not desirable.

The question, then, is; how to restore the lost pabulum consumed by applications of plaster? Experience suggests to me, the practical answer.—Plough in a small proportion of dung; or, what is more attainable, *green* manures. I am aware that my much respected revolu-

tionary friend and successful agriculturist, colonel Taylor of Caroline, differs with me on the subject. He prefers ploughing in *dry* vegetable matter. But that I might not differ without frequent trials; I have tested his practice repeatedly. I cannot agree with him on this point; though I value his opinions on most others.* *His* land may require artificial separation of its parts. I speak of loamy soils; such as mine, and thousands of others. The same medicine will not suit different maladies. Beside, we all know that *putrefaction* is indispensable, before vegetable matter can operate on plants;—without assigning chemical reasons. To effect putrefaction, there must be *contiguity*, *moisture*, and *heat*. Now the earth holds in separation the dry stalks of clover or corn; and prevents contiguity to assist mutual putrefaction. I have seen stumps or stools of Indian corn, unrotted, after lying in the soil two years. So of corn stalks; and sometimes dry hay or clover. This may not be always the case; but no one ever saw green crops ploughed in, remain unrotted. I have also the misfortune, (if it be one,) to differ in the application of muck. I have never found, that unrotted muck, or stable manure, went through the putrefying process, when ploughed in fresh; either so effectually, or so rapidly, as that forwarded in the dung-pen, and ploughed in fermenting, and in its advance to putrefaction and decomposition. Your observations on clover, and the bad style of culture, which prevents its duration, are perfectly rational. But clover, like all other crops, too long

* See our 1st vol. p. 333. Colonel Taylor's *own* experience, "that *green* bushes *with their leaves*, enrich considerably beyond *dry*."

The fact evidently is, that the fertilising qualities of those leaves, and of the whole succulent substance of herbaceous plants, pass away in the desiccation; and leave the *debris* a mere inoperative *caput mortuum*.

repeated, will degenerate; and finally fail, on the best cultivated soils. Some other grass, or crop, for forage, (*millet* I have found the most profitable,) must be substituted, during at least one shift of your rotation: and the land will recover its capacity to produce clover.

Your reasoning and your practice mentioned in your letter, agree so nearly with my own convictions and experience, that I am under no necessity of enlarging on the subject.

The plaster never did more on my fields, than it now performs, where it is assisted by the means I mention. Last year it showed little. On my lawn, not ploughed within many years, its effects are wonderful. I strewed, in early spring, a light dressing of live ashes; with which the plaster co-operates most beneficially. I have cut and secured 35 tons of excellent hay, (clover and orchard grass,) off 16 acres of my little fields. I lease the greater part of my farms;—and my motto is "exiguum colito."—Do no more, than you can do well.

Yours &c.

R. Peters.

Mr. Abiel Jenners.

Observations on the Italian Mulberry and Lombardy Poplar Trees. By the late Joseph Cooper of New Jersey.

Read December 21st, 1824.

In travelling in different places, but more especially between Philadelphia and Trenton, I have observed with regret, great numbers of lombardy poplars in places where they will undoubtedly be found extremely injurious, they being more subject to suckers from the roots than almost any other tree. From my own experience, I believe moreover the wood to be of little value; and from their spiral form they are not calculated to afford shade.

On the contrary, the cultivation of the Italian mulberry appears to be almost totally neglected, although possessed of superior qualities, which render them the most proper to be planted in waste ground, by the sides of fences, and of roads, or in any place where shade is desirable, (except in streets of cities or towns) for the following reasons.

1st. For Shade:—the leaves put out as soon as necessary for that purpose, and are more glossy, clean, and of a more beautiful green than the leaves of any other trees, (evergreens excepted) to which our climate is favourable. The tree too, forms a beautiful top, makes a close shade, drops few leaves, twigs, and little or no bark during summer; and never suckers from the roots: the leaves continue green, until hard frost, then suddenly fall, and are eaten greedily by horses, cattle and sheep.

2d. The trees produce fruit in great abundance, which

begins to ripen, and fall off about the time early cherries ripen, and continues to ripen, and fall off for nearly two months : it is pleasant to our own taste, and wholesome and nutritive to swine and poultry, and so grateful to birds, that they will do little injury to cherries or other fruit, while they can obtain enough of mulberries.

3d. The timber is excellent for boats or ships, posts, or stakes for fencing, and for fuel, and the growth so rapid, that having planted a number of trees near the margin of the Delaware, they obstructed the prospect to such a degree, as to induce me to sell many of them to the boat builders. The trees when cut, measured at their buts to the admiration of many, from twenty to twenty-six inches in diameter. Their age was twenty-three years. The mulberry tree abounds in more heart, than most others of the same age.

4th. As the leaves of this tree are known to be the favourite food for silk worms, and it is probable, as population and industry increase, the culture of silk in the United States may become an object worth attention, it will be advantageous to have trees ready for the purpose.

The trees may be propagated by planting the seed thin in drills, in ground properly mellowed, and manured : and if it be kept clear from weeds and grass during the summer, they will grow from four to eight feet high the first season. The next spring the small trees should be taken up, and planted in a nursery, where they may remain until fit to be removed to the places of their destination ; but care should be taken to prevent horses or cattle destroying them, until of a proper size to protect themselves. They may also be raised from cuttings, a method that has some advantages over the former, as you may have the trees to bear fruit, or to remain barren, according to desire, by observing from what trees the cuttings are taken. The same end may be effected by ingrafting, or

inoculation, both of which modes I have known to succeed well.

[It is to be hoped that the farmers of the United States, will follow the advice of the venerable patriot, and great improver of agriculture, above given, to propagate the white mulberry tree. The rearing of silk worms, is beginning to attract attention, and the successful experiments that have been made, embolden their continuation. The white mulberry tree, grows abundantly near Philadelphia. M]

On Bee keeping in Philadelphia. By James Mease, M. D.

Read December 21st, 1824.

Bee hives have been kept for years by some of our citizens, but from the very extraordinary success, which until the present year, has attended the experiment of one of them, in the very heart of Philadelphia, I have been induced to obtain the following account of it.

In the spring of the year 1821, he purchased one swarm, contained in two or three boxes, made upon the plan of the Rev. Mr. Christ of Krohnberg, in Germany, and having placed them in a small garden attached to his house in Fifth above High street, he was pleased to find that they went to work with great industry, and furnished him abundance of very fine honey. In the present year they had increased to seven stacks, each stack being composed of six or seven boxes, each of the dimensions 14 by 5 inches. One box weighed 54½ lbs. the empty box weighed about 4 lbs. One stack of seven hives was a full load for one man. In August last, he was much mortified to find that the destructive miller moth had completely taken possession of three stacks, and filled the boxes with their webs, and glutinous matter, to the utter discomfiture of the bees, which had abandoned the hives to their inveterate enemies. Despairing of being able to prevent their future depredations, he sold all his boxes. He easily kept the bees from swarming, late in the season, by placing an empty box under the lowest in the stack, when he found upon inspection that it was about half full of comb. He has a few flowers in his garden, and some grape vines, but the bees must have procured the materials for their honey, from a distance, or by visits to the numerous gardens in and about the city.

On the Rocky Mountain Sheep. By Major Long.

Philadelphia, February 16th, 1825.

Gentlemen,

At the suggestion of Dr. Mease, I submit the result of my inquiries, relative to the Rocky Mountain sheep, with the impression, that any intelligence in relation to this interesting animal, will at least, prove acceptable, if it cannot be made useful, to an agricultural community.

The information I am able to communicate, was obtained, on the late "Expedition to the source of the St. Peter's river," &c. and was procured principally, from Donald M'Kenzie, esq. of the British Hudson Bay Company, at the mouth of the Assinaboin river, in the capacity of chief factor. The intelligence furnished by this gentleman, was derived from personal observation, and is in substance, as follows.

The Rocky Mountain sheep, inhabit the elevated region, occupied by that portion of the mountain range, from which its name is derived, situated within the 48th, and 60th parallels, of north latitude. They are found in great numbers near the head waters of the north fork of Columbia river, where their flesh, constitutes the principal food of the natives. The country at the sources of the Muddy (Maria's R. of Lewis and Clark,) Saskatchawin, and Athabaska rivers, is also inhabited by them. But they are said to be less numerous, on the eastern slope of the Rocky Mountain, than on the western. They are seldom or never seen at a distance from the mountain, the climate and productions of which, appear best adapted to their nature, and mode of life. In summer, they resort to the

peaks and ridges, in quest of pasture, but retire to the valleys, in winter.

The size of the animal, is about that of the common sheep. Their fleeces are white, interspersed with coarse long hairs, protruding beyond the wool, and standing erect upon the surface of the body, which gives them a rugged and shaggy appearance. Their horns are short, scarcely projecting beyond the wool of the head, and slightly arcuated backwards. These together with the hoofs are black, while the other parts of their bodies are uniformly white. Their flesh has a musky flavour, and is at best, unsavoury to the taste. Like other animals of their kind, they are of easy access to the hunter, who, however, seldom pursues them, unless compelled by hunger. Their skins are remarkably thick, and of a spongy texture. Their fleeces are esteemed of little value, by the traders, and are used, merely as a covering for the feet, being well adapted to the inclemency of a winter residence, in the region where they are found. Of the silky softness and fineness of their wool, it is sufficient to remark, that in the opinion of those who have made the comparison, it is not probably surpassed, in these respects, by that of the Thibet goat. A skin and specimens of the wool, procured by Messrs. Lewis and Clark, may be seen at the Philadelphia Museum.

At Fort William, on the north coast of lake Superior, we met with a gentleman, by the name of Henry, in the service of the Hudson Bay Company, who had recently returned from a trading excursion to the north-west, in the country before alluded to. The information given by him, in relation to the animal, was similar to that before stated. He moreover informed us that a young lamb had been caught, by one of his party, and kept for a short time, but as no milk could be procured for its nourishment, it soon died of hunger. In its manners, it resembled the young

of the domestic sheep or deer, becoming gentle and tame, immediately after it was captured.

On expressing a desire to obtain a pair of these sheep, Mr. M'Kenzie, the gentleman before mentioned, kindly volunteered his exertions, to procure them for me, and cause them to be transported to Fort William. As an inducement for some person, to engage zealously in the prosecution of this object, I assured him, that a handsome reward might be expected, for two or more healthy lambs or sheep, delivered at that place, subject to my disposal. Of his success in this undertaking, he was to apprise me by letter. As yet, however, no intelligence has been received in relation to this subject.

I am, very respectfully,

S. W. Long.

Philad. Soc. for promoting Agriculture.

[It is now satisfactorily ascertained, that the animal mentioned by Major Long, is a genuine goat. A fine plate of one, is given by C. H. Smith in the 13th vol. of the memoirs of the Linnæan Society of London,* from a specimen in the British Museum. Mr. Smith calls it *antilope lanigera*, wool-bearing antelope: but this is a misnomer, as it possesses marks, totally distinct from animals of the genus antelope.* The wool is more soft and silky, than even that of the Thibet goat, from which the expensive shawls of Cachmere are made. M.]

* 1822.

* See Dr. Harlan's Fauna Americana, p. 256, Philadelphia, 1825.

On the Hoof disease from eating hay affected with Ergot. By James Mease, M. D.

Read March 15th, 1825.

In the year 1803, the late Joseph Cooper of New Jersey informed me, that he had observed the hay made of the natural green grass, or spear grass, (*poa viridis*) growing on his fine meadows, on Petty's island, made by banking out the Delaware, to be occasionally affected with a black spear, about one fourth, or half an inch in length, somewhat resembling the ergot in rye, and that cattle eating such hay, became affected with a disease in their hoofs, causing them sometimes to drop off. He ascribed the morbid production in the grass, to neglect in supplying it with water from the river by means of sluices, during a dry season. Upon my mentioning the facts soon after, to the late William Rush of Philadelphia, an extensive grazier, he confirmed them from his own observations at Blooming Grove, near Gray's Court, in the state of New York, in the winter succeeding the very dry summer of the year 1793. The hay was the produce of a bog meadow, it is presumed therefore, that it was made from the same natural grass that grew in the meadows of Joseph Cooper.

Some years after, Mr. W. T. Woodman of Tredyffrin township, Chester county, Pennsylvania, communicated to me an account, in the following letter, of a similar disease, and from a like cause, among his father's cattle.

Sir,

Having observed the remark, in the Port Folio for May, 1815, in the review of the third volume of the Memoirs of

the Philad. Agricultural Society, that, "as yet, in America, we have never heard of any human person falling a victim to the ergot, nor indeed is it satisfactorily ascertained that it has ever been injurious to our animals," I think proper to communicate to you an account of a disease which in 1802, or 1803, prevailed in this neighbourhood, amongst milk cows particularly; but which also affected other cattle and horses. You will perceive that it was analogous to the one supposed to be occasioned by ergot.

For my part I am entirely ignorant of the cause, but still I am unwilling to ascribe it to ergot, (with which rye in this neighbourhood is more or less affected every year) for this reason, that milk cows, which are never fed with rye by our farmers, or butter-makers, exhibited more violent symptoms than oxen or horses.

The farmers attributed the disease to a peculiar mildew, which sometimes affects the grass on the bottom meadows of a small stream, the basin of which is very extensive, and very luxuriant, and entirely appropriated to meadow land, and suffered to lie under natural grass. No timothy or other grass seeds have ever been sown on it, to my knowledge.

The cattle affected did not appear to lose their appetite, and while they ate heartily of hay or other food, became daily more and more lean, manifesting great uneasiness, occasioned most probably by violent itching. Their hair in many places fell off, or was rubbed off by the animal, in striving to scratch itself. After these symptoms had continued for some time, one or both hind feet became sore, and the hoofs loose, at which period some of the animals began to grow better. Others lost their hoofs and part of their legs. Three of my father's cows lost both their hind feet, and some others in the neighbourhood were equally as bad. The legs began by drying

and growing much smaller from the hoofs to half way between the fetlock and hock; at which point it appeared as if a string of twine were tied very tight round the leg. Above this part the flesh was to all appearance in perfect health; the lower part was hard, black, and offensive. When the lower part became quite dry, and little else than bone, it separated and fell off, after which the animals lived and ate heartily, hobbling along on the remaining stumps. They even began to grow fat. Their health seemed perfect. They would no doubt have lived long in this state, and were killed only from motives of compassion.

One cow belonging to my father, which had lost only one of her hind feet, and that at the first joint above the foot, bore a very strong vigorous calf, which lived and did well. The cow also afforded as much milk after, as before her misfortune, and was pastured on the same grass to which her disease was attributed when in the state of hay.

I think the disease was never known but one season. The first symptom of it was observable in February, and it reached its crisis about the middle of May. Should this communication lead to any further observations on the nature and cause of the disease, I shall be much pleased, and they may be of great service to the agriculturalist. Should the disease ever again make its appearance, I shall be more particular in my observations.

I remain, very respectfully,

WM. T. WOODMAN.

P. S. It should be observed, that though we have every year more or less of the ergot, the quantity of it is never considerable. I think there is seldom more than one pint to a hundred bushels of rye.

Different remedies were tried, but none of them afforded any relief.

Being desirous to ascertain whether the disease of the grass to which Mr. W. referred, had grown in meadows that had been deprived of their usual supply of water, I addressed a letter to him in reference to this point, and received the following answer.

Tredyffrin, June 10th, 1815.

Sir,

Your favour of the 30th ult. came to hand the 4th inst. Since the receipt of it, I have made numerous inquiries, for the purpose of obtaining additional information, respecting the disease, (of which I communicated an account) and on the season preceding its prevalence &c.; but I regret to inform you, that farmers, in general, are so deficient in observation, and so entirely out of the practice of recording facts, that I have not been able satisfactorily to ascertain, whether the season, in which the "injurious hay was made," was a dry one or not.

However, my father informs me, that as nearly as he can recollect, about that period, the ditch which conveyed water to his meadow, became so filled with accumulations of mud and other matter, as to render the supply very imperfect. As a deficiency of watering, appears to be the cause of the unwholesome qualities of the hay, it is highly probable, the injurious hay was made during the season that water was wanting. But shortly after this time, the death of my grandfather, in a great measure excluded my father from the benefit of the water. The original plantation, being divided into two farms, and that of my father lying farther down the stream, the water of the artificial course is exhausted, before it reaches his land. It should however be remarked, that since that period, he mows his grass while it is very young, and before the seeds are touched by the "smutty affection." Indeed the farmers generally, in this neighbourhood, since

their cattle were affected with the disease, are careful to mow much earlier than they did formerly.

I am strongly induced to believe, that Mr. Cooper ascribes the disease, to the proper cause; for I have been correctly informed, that a load of the injurious hay was sold to —— Rogers, who at that time kept the Buck Tavern, in Second street, whose cow, in consequence of feeding on it, was affected with a disease of a similar nature.

Your friend, &c.

W. T. Woodman.

The disease prevailed to a great extent in Orange county, New York, in the year 1820, and is very well and minutely described by Dr. Arnell, corresponding secretary of the Agricultural Society of that county.* The facts detailed by him, leave no doubt of the deaths of numerous cattle in his vicinity, being caused by their eating hay, made from some grass that was affected with the species of ergot, observed in the produce of the meadows before mentioned, for he expressly mentions that the spear grass grew in the meadows, in the towns of Wallkill and Blooming Grove, where the disease prevailed, and in a bog-meadow soil. Dr. A. remarks, that, "the hay was cut in June, or beginning of July, immediately before harvest: that, only cattle in good condition, suffered from eating the diseased hay, the poor and meagre escaping." The means of prevention, pointed out by Dr. Arnell, are similar to that, judiciously recommended by Mr. Woodman, viz. to cut the grass, early before the ergot forms; or, if it be found in the grass, to deter cutting it until late, when experience proves, that it may be safely used; for Dr. A. remarks, that "the ergot then becomes dry, and shrivelled, without any of the flour, or

* Albany Plough Boy, vol. 3. p. 44.

vegeto-animal matter, which it usually contains." But the hay made from such late made grass, must be of little value, because Dr. A. says truely, that "this spear grass, is so early, that if left to stand until the usual time of mowing meadows, it loses all its succulent and nutritious properties." This agrees with our experience, with respect to the spear grass in Pennsylvania, where it ripens next in order, to the early *anthoxanthum odoratum*, or sweet-scented meadow grass. Still, however, it may be useful, by answering one purpose of food in all animals; to stimulate by distension, and to add to the stock of barn-yard manure. The various remedies, tried to cure the disease in New York, are enumerated by Dr. Arnell.—Those that succeeded were:

1. Poultices of soap, rye-meal, and salt, to the legs, and feet.

2. A wash of beef brine, composed of saltpetre, and common salt, applied several times a day, and after washing and rubbing the feet, with the *bitter-sweet* ointment.* Of the animals thus treated, one only lost its hoofs.

In the treatment of the disease, the first object to be attended to, is to remove the cause producing it. This is to be effected, by drenches of castor oil, or sweet oil and molasses and water warmed, to which may be added, if found necessary, after the failure to operate of the first dose, half a pound of glauber salts, dissolved in warm water. During the operation of the drench, corn-meal, rye, or oatmeal, mixed with a large proportion of warm water, and an handful of common salt to every bucket of it, should be freely given. The use of hay free from ergot is as

* Bitter-sweet, or woody night shade, (*solanum dulcamara*) a well known medical plant; long used in Europe. It is questionable whether from this external remedy, any benefit was derived in the case of the cattle, except from the effects of the friction used in its application.

obviously indispensable. A handful of salt should be given every day to promote digestion, and give tone to the system. The local applications, must be of a stimulating nature, to rouse the activity of the circulation and of the absorbents, and to enable the part labouring under a deficiency of vital energy, to resume its healthy functions, or to throw off the disease. Fish or beef-brine will answer as well as any, but they should be well rubbed on the feet and legs, for friction greatly tends to assist in restoring the health of the parts. To prevent the appearance of the ergot in the grass, care should be taken, when practicable, to supply the meadows with water in dry seasons.

On Italian Hemp and Flax.

Read May 17th, 1825.

EXTRACT of two letters from Mr. Appleton, consul of the United States at Leghorn, dated 10th June, and 6th December, 1824, to Dr. Mease.

"I now send you a bag containing some seed of the far-famed Bologna hemp, and Cremona flax. The former is twice the length, and nearly twice the strength of the Russian hemp; it is fair and white, and sells here at 50, when the latter will command only 30.* The Cremona flax sells invariably for double as much as all other flax known. I also send a small sample of this flax, that it may be compared with others, and with the produce of the seed; and also a translation of instructions, by Professor Tozzetti of Florence, on the cultivation of hemp and flax."

Instructions on the cultivation and preparation of Hemp, after the method used in Bologna, and of Flax, after that of Cremona. By Professor Tozzetti of Florence.

HEMP requires a good, and deep soil, rather damp, not tenacious, deeply tilled, and well manured. It thrives well in newly tilled meadows, provided they are not clayey; and in level woody-lands, recently broken up. The tilling of the ground is done with the spade or mattock, in double digging, or else it is dug two or three times

* Livres are here meant: hemp is sold by the 100 lbs. at Leghorn.

successively. By breaking the ground, by means of the plough, repeating the furrows, the hand work is spared, but the soil is not so well prepared, as with the spade. In the *Bolognese* they manure the ground in autumn, at the time of the second digging. In other places, and especially in *Romagna*, at the digging performed in March, they sow beans, rather abundantly, and these they dig up in autumn, oversetting all their plants. In the next spring, they dig the ground over again, and sow the hemp, when they are sure of having no white frosts. Some shut up their sheep in the field, where they intend to sow the hemp, and dig immediately, the spaces of ground abandoned by them. The scraps made by the silk worms, horses' dung, and animal muck of every kind, are excellent for the hemp. The Bolognese prefer cattles' horns and hoofs, which are procured from the butchers, and then, by means of a machine, they grind them, like coarse saw-dust, and spread them as a manure. They make use also of fowls' and birds' feathers, which they buy of the people who sell poultry in the market, already dead, and picked. They keep these feathers in the water for a space of time, in order to macerate them, and prevent the wind from dispersing them. They are then spread. Some cultivators scatter on the field, pigeons' or hens' dung at sowing time; others scatter it afterward, waiting for weather that has appearances of rain. Care must be taken that the seed do not get totally enveloped in the above manures, because they would be hurt. The seed must be shining, high coloured, and no more than one year old. As soon as it is sown, it is covered up by a light harrow. It is necessary to preserve it from the rapacity of the birds, and for that purpose, they put here and there about the field, several moveable objects, exposed to the wind, to frighten the birds away. Those who wish for long and

thick filaments fit to make cordage with, sow the seed so as to have the plants half a foot distant from each other on every side; and then it is necessary to weed them occasionally. Those who desire a finer grain for linen, sow the seed thicker. In the Ferrarese, where hemp is cultivated to make cordage, I have seen it about eight *Braccios* (eleven feet) high. In Romagna, where the method of oversetting the beans is general, they dig and manure the fields again in the spring, previous to their sowing them. This hemp is the finest of all, the best prepared, and the most proper to make cloth with. This plant being of two sexes, divided into two plants or *Doiecia*, the male one, that bears no seeds, is reputed better than the female one that bears them, because the first grows taller and thinner, and does not spread out its branches. The male hemp, is the first to be gathered; the female one is gathered three or four weeks afterwards, in order to let the seeds ripen. If the first is small, and good for linen, they pluck it up by the roots, when the flowers have already poured out the fructifying dust, when the top begins to get yellowish or whitish, and when the undermost leaves begin to grow yellow, and to fall off. That quality of hemp, which is larger, and fit for cordage, having the roots stronger and deeper, is not rooted up, like the other, but cut with a small axe, very close to the ground; a practice much recommended by the owners to the labourers, with the view of not losing any weight. The female plants are cut, when the seed, having acquired a dusky colour, shews itself out of its *Chalice*, or wrapper. This species of hemp gives an inferior kind of filament. When the male hemp has been gathered, it must not be bound up immediately into bundles, but left for two or three days, and laid against the females plants, which by so doing will be protected against the drought, which would be preju-

dicial to them, and their seed, will acquire a more perfect maturity; while the male hemp will in this interim, reap the advantage of drying the earth adhering to its roots, which will then be easily shaken off.

MACERATION AND PREPARATION OF THE HEMP.

There are several methods for macerating hemp, in order to loosen the fibrous parts of it. This can be done, by exposing the hemp on a meadow, to the influence of the atmosphere, and especially to that of the dews, turning it every day; and then while still wet with dew, let it be heaped up to undergo some degree of fermentation; but this practice is not one of the best, because the hemp gets unequally macerated. In countries where there is no water to submerge it, maceration may be effected by putting the bundles in ditches, dug in the ground, putting by turns a stack of bundles, and one of earth, covering them well with earth.

The best method of all, is that of plunging the hemp into the water in receptacles made for the purpose, some of which, very large, are to be seen in the territories of Bologna, Arezzo, and Ferrara. Some put the hemp to macerate in the running water of a river, but experience has shewn, that it does better in still water, nay, if possible, in water that has already macerated other hemp. Having chosen the convenient pond, the borders must be raised a little to prevent the rain from carrying any earth in to it. They then prepare the hemp; well dried, and cleansed from the leaves, they cut off its roots and thinnest extremities, which they put aside to macerate separately. They then make it up in bundles, all of an equal length and size, not too closely bound, and these they dispose in the pond alternately, one opposite to the other, for these bundles being of a shape somewhat conical, they occupy

less space, by being so distributed. The bundles made of this species of hemp, must be put to macerate separately, from those of a finer quality. The same precaution must be used with the hemp, that has been gathered, when fully ripe, and that is less perfect. When the pond is full, let a weight be laid upon the bundles, in order to keep them always under water. In the ponds of the Bolognese, they drive in the bottom, some stakes, at the distance of three or four feet from each other, having at their tops a notch, in which they fit horizontally other poles, to compel the bundles to lie under water. It is necessary to keep the ponds always full of water, so that the hemp be not left exposed to the sun. The true degree of maceration, is when the thready fibre separates easily from the wood, and this can be ascertained by taking a few stalks out of the bundles, and breaking them in several places to see whether the fibres detach with ease. When the hemp has acquired this decree of maceration, they take it out of the pond, and wash it well in clear water; they next put it to dry in the sun, untying the bundles, spreading and turning them, to have them equally dried. When the hemp is perfectly dry, they beat it with cudgels, upon a large plank or stump, in order to break the woody part. After having plucked out the coarsest lints, they make it undergo the operation of the *Gramola* (or mashing engine.) This is an implement composed of three parallel rulers, the corners of which are sharp and round, and in the interstice of which, enter two other rulers, exactly like, and joined by means of a ring at one of the extremities, with the others. This implement breaks and separates the small woody pieces that had remained after the first operation of beating it with cudgels. They then toss the hemp, and shake off whatever there is left of wood, with the *Spattle* or *Slice*. The *Gramola* alone may be sufficient to break thin hemp: the

machine of Christien of Paris will do the same for that, which is thin and short, but this single operation will never be sufficient for long and coarse hemp. The hemp so cleaned, and especially the coarse quality for cordage, is put up in bales for commerce, and the finest quality is carded, in order to be spun.

Of Flax.

The best flax amongst us, is that which is cultivated in the *Cremonese* and *Cremese*. In other places, its filaments are neither so long, nor so thin, and its cultivation is not profitable. As it impoverishes the land, it requires a good soil. Two species, or rather two varieties of flax are cultivated. One called *Vernino*, (growing in winter) and the other *Marzolo*, (growing in the spring.) For the first one, they till the ground in summer, manure it in August, and sow it in September. This species withstands the cold, but gives a coarser filament, and a larger quantity of seed. The *Marzolo* is that which is generally sown in the Cremonese. It delights in a light soil, not clayey; substantial, but not too rich; it requires open and unshaded fields. They till the ground in autumn, and level it with the harrow; they then go over it with the roller, and once more with the harrow, if it is not perfectly even. About the end of March, when the white frosts are over, they sow the flax. Having the advantage of watering the field, the flax thrives well; but this must not be done, until the atmosphere begins to grow warm, that is to say in April or March amongst us. The irrigation must take place every ten or fifteen days, but never when the flax is in blossom. Flax requires a very diligent weeding; especially on account of the *Gatta del Lino* (*Cuscuta Eu-*

ropæa)* which does it great harm. Flax is sown rather thick, to the object of having longer stalks; by sowing it thinner, it throws out its branches, and produces a larger quantity of seed, from which they extract the oil. When the stems begin to acquire a light green colour, inclining to yellow, and have lost three-fourths of their leaves, they pluck it up by the roots, pack it up in bundles and leave it out to dry, in order to extract the seed; it is then put to macerate. The water must be pure and running; the pond must be walled, and well plastered within. They fill up the pond entirely, and contrive so as to have the water going in and out, passing over it, without stagnating in it. The maceration being complete, they clean the pond, and put in other flax.

The bundles taken out of the pond, are put up in a round heap, with the roots outside, and are covered with boards and stones. Some days afterward, they feel the flax with a hand, and if the heap begins to get heated, they undo it, and spread the bundles, exposing them to the sun. They are in the sequel, laid under the *Gramola*, beaten with the spattle, to shake off the hard or woody part, and lastly, combed.

The experiments made here with Christien's engine, have been rather successful; breaking the flax, and depriving it of the woody part, as soon as it is dry, without macerating it, and then packing and combing it, a finer and stronger filament is obtained, of a yellowish colour, which it looses by boiling it with soap. By this method, we have had it in a single day, mashed or cleaned with the engine, combed, spun, and bleached.

In Tuscany, they make a common, but very durable cloth, with the bark of the *Genista*, (Spartium junceum) or *broom*, which abounds every where in untilled grounds. Such a manufacture is carried on at the *Casciana Baths*,

* Dodder.

(Bagni di Casciana) in the territory of Pisa, where they macerate the *Genista*, in the course of a single day, in the remains of the mineral water of said baths. Very fine and white thread is made from the rind of the *Urtica nivea*, a native of China, but this plant does not thrive well amongst us, on account of the heat and drought that we generally have in summer; the *Urtica nivea* liking better a damp soil.

[Italian hemp as imported for sale, is from six to nine feet long. The manufacturers agree that the fibre is softer and stronger than that from Russia, but is more difficult to spin, owing to the greater abundance of gum in it. The difference in time required to spin the two articles, is one-fifth. They add, that it heckels with less ease than the northern or American production. Three men are required to prepare Italian hemp, for the same number of spinners, which can be kept at work by two men when heckling American or Russian hemp. Cordage made from Italian hemp, absorbs more tar, and becomes much stiffer in cold weather, than the other kinds. Hence it is concluded to be peculiarly suitable for a warm climate.

Whether the greater abundance of gum in the Italian hemp is connected with the nature of the vegetable, or depends upon being imperfectly watered, and broken, cannot be ascertained at present. The latter conjecture is probably the correct one, as the article bears strong marks of being prepared with little care. The fact does not therefore militate against the cultivation of Italian hemp, although it forms one objection to the working up of the article as imported. If the gumminess should be found to be natural to the Italian species, the difference of our climate and soil will be likely to cause its disappearance: a little additional care in water-rotting it would certainly remove the objection to its growth, arising from that circumstance. An experiment shall be made with the produce of the seed sown last spring, to determine the point. M.]

Observations on the means of preventing and relieving the accidents and diseases, to which farmers are particularly subject. By James Mease, M. D.

Read May, June, July, August, 1825.

I HAVE frequently had occasion to witness the sufferings and even the loss of lives, which have taken place among people in the country, owing to their being unacquainted with the dangers, to which, upon certain occasions, they were exposed; through their inattention to an apparently trifling disease or wound; or, to their neglect in applying suitable remedies, in the early stage of a disease; and have therefore thought, that I might render an acceptable service to them, by calling their attention to a few subjects, and by suggesting the means of prevention and relief, which will be found effectual and easy of application. My object is not to supercede the necessity of a physician; on the contrary, if a good one be within reach, he ought to be employed, and at an early stage of an accident or disease; but it often happens that no one may be near, or that no apprehension of present, or future danger exists, when there are grounds for serious alarm. In such cases, my advice will be opportune: it may also happen, that medical men will derive useful hints from the practice I shall recommend, as I should doubtless do, by reading their own observations on the subjects upon which I shall treat.

Simple Incised Wounds.—Nothing more is requisite, when the cut is not extensive, than to bind up the part, and to permit the balsamic blood to effect a union of the muscular fibres. The common applications of brown paper,

dipped in ardent spirits, and covered with brown sugar; or of balsam-apple infused in spirit, answer no purpose, except that of giving unnecessary pain. When a small vessel has been divided, and the blood flows freely, one or more strips of linen or muslin, may be covered with Canada balsam or sticking plaster, and applied to the part, across the line of the wound. Even in cases where a portion of flesh has been sliced nearly or entirely off, it should be instantly replaced and covered with the plaster, and lint over it; as under such a circumstance, a union of the divided parts will take place. The bandages should be permitted to remain until the wound is cured;—say a week or ten days. The part may then be soaked in warm water, and the bandage cut through with a sharp pair of scissors. Even when the laceration of flesh or skin has been considerable, a union will be effected, provided the parts be united speedily, and covered with the sticking-plaster, as above directed. Dirt and all foreign matters, it is obvious, should be removed in the first instance: quiet to the part is indispensable.

Punctured Wounds.—When a nail, splinter, or thorn, has penetrated a foot or hand, immediate attention should be paid to the wound, as it is from such a cause that the terrible disease Tetanus, or locked jaw proceeds. The part should be covered with lint dipped in spirit of turpentine, and occasionally renewed to excite inflammation in the wound, which must not be allowed to heal for a week or two. This mode has been so well, and so long tested, that it is recommended with confidence. Instances have occurred of Tetanus taking place, six weeks after a nail or thorn had been run in the foot, and the wound healed. The first symptom of the Tetanus is often a severe pain at the pit of the stomach. The rigidity of the jaws, and back of the neck, soon follows, and at intervals, the body is drawn backward by a violent spasm.

Treatment.—Open the punctured part, and fill it with lint, dipped in spirit of turpentine. If the spasms are very violent, and the sufferer be a strong man, 16 oz. of blood may be taken away. The cold bath must then be used, dashing two or three buckets full of cold water in quick succession, upon the naked body; after which, powerful friction with coarse cloths, should be employed, and the patient put to bed. A glass of Madeira wine is then to be given, regularly every half hour, until a powerful impression be made upon the system. It is surprising how much wine may be taken in this disease, even by one not accustomed to the use of it in health, and it must not be withheld from the fear of intoxication. If the disease does not yield to this treatment, the cold bath must be repeated. As the bowels are obstinately costive, they must be opened by ten grains of calomel, and fifteen of jalap, or by castor oil, aided by glysters. Ample experience authorises me to say, that opium, although often given, is useless, and frequently hurtful in this disease, when given internally. It neither relieves the spasm, nor procures sleep, and interferes with the treatment, which is known to be succesful. Externally applied, in the form of laudanum, and mixed with oil, it may however be useful, by relieving the painful rigidity of the muscles of the jaw and neck. The proportions of each should be equal. The rigid parts ought to be covered with flannel, after being well annointed with the mixture. A large tea-spoonful of Peruvian bark should be given every hour during the disease, and three times a day for some days after recovery. If the treatment recommended, should fail in making an impression on the disease, I advise the use of Dr. Hartshorn's plan, of inflaming the surface along the course of the spine, by means of caustic potash. The mode is, to tie a piece of sponge to a fork, and after dipping it in a solution of the caustic in water, in the pro-

portion of a drachm to the ounce, and to apply it two or three times along the whole course of the spine.*

Another cause of Tetanus is, the exposure of the body during sleep to a current of air, after being heated by exercise, work, or after a hot day. Persons thus exposed, are aroused from sleep by spasms of the muscles, and stiff neck. An emetic has been found very beneficial in such cases, as a first remedy. Powerful perspiration should then be excited, by covering the body with blankets, and the use of weak snake-root infusion, taken as hot as possible, and kept up for three or four hours. If the stomach rejects it, hot lemonade or hot thoroughwort infusion may be taken. If the disease do not yield to this treatment, the cold bath, with powerful frictions, must be used, and the remedies given, as before recommended.

If the rigidity of the body do not amount to actual Tetanus, the same treatment is still to be pursued. After recovery from either forms of the disease, the body is left in a very weak and irritable state, and in females particularly, great care is to be taken to keep the system in as tranquil a state as possible. Every source of mental irritation, must be carefully avoided, and the diet be generous and easy of digestion. A glass of wine, or sound bottled ale or porter occasionally taken, will be highly proper. The disposition to costiveness, is to be relieved by mild purgatives of castor oil, or epsom salts.

Dysentery.—This is a very serious complaint, and deserves particular consideration, inasmuch as it is not like many other diseases, confined to one person, but often prevails as an epidemic through a country town, township,

* The medical reader is referred to the case cured by the above treatment, by Dr. Lewis of Pittsburg; Med. Recorder, vol. 3. p. 170, and to the remarks of the author on the subject, in vol. 2. p. 297.

or county. Scarcely a year passes, without the newspapers announcing its prevalence in some part of the United States. The particular symptoms which mark the disease, are frequent calls to stool, with trifling but bloody discharges, attended with great pain in the bowels and loins, and slight fever. The first point to be attended to, is to open the bowels thoroughly, by mild purgatives. Epsom or Glauber's salts, and for children, magnesia are to be preferred. An ounce of either of the two first, dissolved in a pint of hot water, to which a grain of tartar emetic should be added, may be taken at two doses, in the course of an hour. They should be worked off with thin gruel of corn-meal. A prejudice prevails among some physicians, and with people generally, in favour of castor oil, as a purgative in this disease, but ample experience warrants me in saying, that it is not supported by fact. This prejudice is grounded upon the supposition, that the oil will sheath the tender and inflamed coats of the intestines, as well as open the bowels: but there is more reason to believe, that the febrile state of the intestines, and the acrimonious nature of their contents, will render the oil rancid, and cause it to prove a source of irritation and increase of disease. It has occurred to me to know of the deaths of several persons by the dysentery, in the year 1816, in Philadelphia, all of whom took repeated doses of castor oil. The safety of the neutral salts, has been sanctioned by the practice of the most eminent physicians; exclusively of their purgative property, they are proper from their sedative operation. If the pain in the bowels be severe, and headach and fever attend, twelve ounces of blood should be taken away from a grown person, and a proportional quantity from a youth. Injections of warm water, in which a portion of starch has been mixed, and a tea-spoonful or two of laudanum, will ease the pain in the bowels. Equal parts of laudanum and sweet

oil should be rubbed on the belly, and perspiration promoted by covering it with flannel, by lying in bed, and drinking freely of rice-water, in which a stick of cinnamon has been boiled. If it be possible to obtain the inner bark of the slippery elm, it should be infused in water, and the mucilage taken freely and frequently. No article in the materia medica equals this as a demulcent, and its speedy operation in affording relief to the pain in the bowels, in dysentery, has been amply tested. An infusion of the leaves of the bêne plant,* has also been used with signal success. If the pain continue violent after the bowels have been well opened, a blister to the belly will seldom fail of relief. In this stage, twenty, thirty, or forty drops of laudanum, may be given at night, if sleep cannot be obtained without it.

The salts or magnesia must be repeated, at least every other day, during the continuance of the bloody discharges. When they have ceased, and a simple diarrhœa or lax remains, it may be gradually checked by the use of laudanum at night, and a tea-spoonful of burnt brandy and white sugar, taken frequently in the course of the day. The diet in this disease, must consist of the mildest and most bland food, as arrow-root jelly, jelly of calves feet, without wine; or, of flour boiled hard, grated, and then boiled in milk with cinnamon, and sweetened with loaf sugar. The utmost attention to cleanliness, in this disease, is indispensable. Nothing offensive must be allowed to remain a minute in the sick room: the sheets, linen, and bed clothes, are to be daily changed, and thin lime-wash kept in the chamber utensil.

In very obstinate protracted cases, it is necessary to touch the mouth with mercury. For this purpose, two grains of calomel may be given, night and morning, with

* *Sesamum orientale.* See my account of this remedy in the dysentery. Coxe's Med. Museum, vol. 2. p. 159. Philad. 1806.

ten drops of laudanum, until the desired effect be produced. The disease vanishes soon after the mouth becomes sore. But the remedy is not proper in the early stage of the complaint.

When the disease is epidemic, in a town or district, it may be often prevented, by taking an occasional dose of epsom salts or magnesia ; by great attention to diet, avoiding unripe fruit and cucumbers, and unnecessary exposure to the night air, the hot sun, or to alternations of heat and cold. The dysentery is not necessarily contagious, but may become so, by inattention to cleanliness. When the disease prevails therefore in a vicinity, all intercourse with the sick, beyond what is required by the calls of humanity should be avoided : the idle night gossiping of servants must be strictly prohibited. Advice respecting cleanliness, when it can with propriety be given, may prevent the spreading of the disease.

The diarrhœa, which often follows dysentery, may be cured by taking *a weak* watery infusion of the roots of the blackberry or dewberry shrub.

Colic.—This disease proceeds from various causes, as eating acid fruits or flatulent vegetables, drinking acid liquors, exposure to cold, and worms in the bowels. It is sometimes the first symptom of an inflammation of the liver. In every case it should be early attended to, for the pain is not always proportioned to the danger. In simple colic of the bowels, forty or fifty drops of laudanum, or a grain of opium, if taken within the first hour of attack, will frequently check or cure the disease. Hot spirits and water, is the common remedy, but should be avoided. Whether sleep be, or be not obtained from the use of laudanum, it is indispensably necessary to open the bowels thoroughly, by taking an ounce of epsom salts, dissolved in a pint of water, or a dose of castor oil, to be worked off with thin corn-meal gruel, to which a little salt has been

added. Bathing the feet in warm water, will aid the operation of the medicine, and tend to relieve the pain. When the bowels are obstinately bound, a laxative injection should be given.* During the operation of the medicine or injection, care must be taken to avoid exposure to cold. If the pain return after the bowels shall have been opened, twenty or thirty drops of laudanum, may be taken every half hour, until relief be obtained. The warm bath should also be used, and will speedily ease the pain. For want of a proper bathing tub, a large washing tub may be used. In this the person may sit on a stool, surrounded by a blanket, with his head out, and bathe his belly with the water: or if he cannot do this, let him sit over very hot water, having his feet in a smaller tub of water less heated, for half an hour: he should then be speedily wiped dry, put to bed between warm blankets, and take a draught of weak warm ginger or mint tea. Children in whom colics frequently occur, are to be treated in the same way: they can be immersed in warm water. In infants and young children, pains in the bowels are commonly caused, by superabundance of acid in the stomach and bowels. The proper purge for them is calcined magnesia, (a medicine which operates in a small dose,) mixed with peppermint infusion, or essence of peppermint and water. As it is perfectly safe, great caution in the dose is not necessary, one or two tea-spoonsful may be given in water.

When the pain in the bowels is very severe in grown persons, or has been permitted to continue for some hours, without any medicine being taken, twelve ounces of blood should, if possible, be lost, in addition to the other means

* This may be composed of a pint of warm water, a wine-glass full of sweet oil, or melted hogs' fat, one do. of molasses, and one large tea-spoonful of table salt. A pewter syringe should always be used in preference to a bladder and pipe.

prescribed. If the pain do not abate, apply thirty or forty leeches to the belly.

Persons habitually subject to colic, should carefully avoid wet feet, exposure to rain, or to a draught of air when warm. Attention to diet is also requisite. Those who indulge in articles of diet or drink, which, however pleasant, are known by them to be injurious, deserve no pity if disease follow their use. In winter, they should wear a flannel shirt, and regularly change it once a week. In warm weather, a muslin shirt, under that commonly worn, should be substituted, and changed at least thrice a week. The feet may be kept dry by wearing over-shoes of leather: or for short walks, shoes with wooden soles, and leather vamps. If the soles be divided, and connected by a piece of leather, the wearer will be enabled to walk more easily.

Harvest.—The harvests of both hay and grain, are times full of danger: from the heat of the weather, great bodily exercise, imprudent indulgence in the good cheer which is generally provided; from accidents in carelessly handling the scythe and sickle, and in stowing away the crop in barns or stacks; and lastly, drinking cold water while heated. Against the effects of a heated atmosphere and blazing sun, a salutary precaution, is the use of a straw or chip hat, or of one made of pasteboard, with a broad brim to shade the neck. A heavy black wool or fur hat, adds greatly to the heat of the head, by its weight and the absorption of the rays of the sun; while one of the other materials mentioned, diminishes much of their force by its comparative lightness, and by the reflection of the sun from its light colour. Another remedy is to avoid the unnecessary severe exertion of the body, arising from the too common practice of competition for quick work among the labourers. The difference in the feelings of those the day after they have thus absurdly

over-exerted themselves, and of others who leisurely finished their tasks, is very great. In the one case, a stiffness in the limbs and a general indisposition, are often the consequence; while in the other, the labourers are ready upon the return of the day, to renew their work. Some farmers upon a false pecuniary calculation, encourage such trials of speed. But exclusively of the risk of health, and consequent loss of time, more is lost by running over a field, than is saved in wages and food. Good and clean work, more than speed, is desirable.

A greater quantity of ardent spirits than necessary, is commonly used in the harvest field. A nominal quantity per day is sometimes stipulated for, but this seldom holds out, and a farmer who is anxious to secure his crop, and keep his hired men in good humour, will not hesitate to indulge them in an additional supply, if demanded. Intire relief from the disagreeable task of measuring out spirits may often be avoided, by contracting with a person to cut and secure the crop; a gentleman farmer should always endeavour to do so. When a general indisposition takes place after severe labour in the field, the best remedy is, an infusion of *thorough-wort*, a plant growing along creeks and in moist places. It should be taken strong at first, to operate as an emetic and purge, and afterwards it may be drunk weak, but warm, to promote perspiration, which it will do most powerfully. The person affected must lie in bed. If the head ache, ten or twelve ounces of blood should be taken away; and as little nourishment as possible be given, until the stomach recover its tone, and the whole system its healthy action.

A still more serious peril attends harvest. This is the sudden loss of sense and muscular power, from imprudently drinking cold water, while the body is very warm. The remedies must be active and speedily applied, or death will be the inevitable consequence, even before a

medical man can attend. Whiskey or spirit mixed with hot water, if at hand, must be freely given: the first draught may consist of equal parts. The body should be well rubbed with coarse towels, dipped in hot whiskey and water: the temples chafed with pure whiskey, while a large kettle of hot water is heating. If possible the sufferer should be put into a hot bath; but if a bathing tub be not at hand, the body is to be stripped, and blankets dipped in hot water must be laid over it, renewing them as they cool. Hot toddy is also at the same time to be freely given, if the power of swallowing remain.

Serious wounds have sometimes happened, from careless persons leaning a pitchfork against the side of a stack of hay or grain, with the forks up and men sliding down upon them. The master of a farm may often prevent such and other accidents, by directing his attention to the thoughtless conduct of labourers.

Concussions of the Brain, and Strokes on the Head.—Require the loss of more or less blood, in proportion to the degree of injury received, and the age, habits, and constitution of the person injured. The sooner it is taken away, after the accident has happened, the better. The person should be bled if possible, while sitting or standing up, so as to induce a faintness, and thus save the loss of an unnecessary quantity of blood. A purge of Glauber's or epsom salts, or castor oil should also be given, and entire abstinence enjoined for one or two days, and then the least possible quantity of liquid vegetable food, for two weeks is to be taken. Rest and silence are essential. As serious complaints have occurred, after an interval of between ten and sixty days, from a blow on the head, great attention should be paid, not to excite the system to the production of the morbid state, to which it is predisposed from the accident. The same remarks will apply to falls.

Sprains.—When a limb has been sprained, and the accident happens at a distance from home, the sufferer should, if possible, be conveyed home in a carriage of some sort; the part is then to be bathed with cold water, and kept in a horizontal position. If much inflammation attend, leeches should be applied. The most absolute rest is necessary to a cure, and the sufferer must make up his mind to endure the confinement, unless he prefers stiff joint, or to risk a fall, and increase of the complaint, by walking before he ought to put his foot to the ground. Even walking up and down stairs, to and from bed must be avoided. After the inflammation and swelling have subsided, the part must be gently rubbed with the hand, upon which a few drops of sweet oil have been dropped, for ten minutes, three times a day: the good effects of friction in removing the rigidity of a part are slow, but certain. Bathing the part with warm water occasionally, before rubbing it, will assist in relaxing the muscles and tendons. After a severe sprain of the ancle, a laced boot should be worn to give a mechanical support to the joint.

Sore Lips.—The febrile state excited in the system by the heat of the weather, the stimulating food and strong drink, so freely consumed during harvest and summer, are the causes of this complaint, which is very painful, and often continues for weeks. Sometimes the cuticle of the lips will entirely peel off. The means of cure are, first, a purge of an ounce, or half an ounce of Glauber's or epsom salts, or the same quantity of castor oil, a vegetable diet for a few days, and a total abstinence from salt meat. The lips may be bathed three or four times daily with clear lead water, in the proportion of twenty grains to a pint of rain or spring water, and then covered with a soft linen rag smeared over with an ointment, composed of bees' wax and sweet oil, or fresh hogs' lard. If pain attend the re-

moval of the rag, the water may be applied without taking it off. A much neater application is gold-beaters' skin with which the lips should be covered, after using the lead water, and permitted to remain on.*

Inflamed Eyes.—The remedies for a slight complaint, are opening the bowels by any of the medicines just mentioned, bathing the eyes frequently with *clear* lead water; living on a vegetable or milk diet, wearing a light hat, and avoiding exposure to strong light. When the complaint is severe, in addition to the foregoing, twelve or sixteen ounces of blood should be taken away from the arm; very low vegetable diet strictly adhered to, aided by confinement in a dark room, and purges every third day. If the disease be obstinate, or attended with pain, blood should be drawn from the head and temples by cups and leeches. This local depletion seldom fails to relieve. The jelly of the pith of sassafras applied to the eye, will give ease. After the inflammation is reduced, wash the eyes three or four times a day, with a solution of white vitriol in soft water. The proportions are ten grains to half a pint of water. Watery eyes may be cured by the same remedy, and the return of the weakness prevented, by washing the eyes with strong brandy and water twice a day.

The exposure of the eyes to the light must be gradual, after the inflammation has subsided, and two or three days must be employed in accommodating them to broad day-light. Persons with weak eyes, when reading, should sit with their backs to the light, and when exposed to a blazing sun, goggles must be worn.

* The gold-beaters' skin, must be applied dry; if moistened, it crumples and cannot be made to lie smooth. The part to which it is applied, is first to be wetted, and the skin then laid on, having previously slit the edges to accommodate it to the lips.

Chilblains.—Are often produced from exposure of the hands and feet to the cold, and then to the heat of a fire. In some persons they are occasioned by unavoidable exposure to the daily change of temperature in the open air, and in the house. Various remedies have been prescribed for this troublesome disease. It is often removed by bathing the parts affected in cool water, twice or thrice daily, and keeping them in it until the itching and pain are allayed. They are then to be covered with a warm stocking or glove. In others, the application of spirits of wine, soap liniament, or a strong solution of alum, or of strong vinegar, or of a mixture of equal parts of oil of turpentine and balsam copaiva: a mixture of two parts of camphorated spirit of wine, and one of lead water; or a mixture of one part of tincture of Spanish flies, with six of soap liniament, in different cases have afforded relief. The means of prevention are, to avoid the causes mentioned. The complaint is often produced by exposure of the feet to partial draughts of cold air from a door, while the body is immersed in the warm air of the upper region of the room.

Whitlows.—There are different species of this painful disease, all of which should be attended to without delay. They often proceed from bruises, pricks of splinters &c. No benefit arises from promoting suppuration in the part. The best practice is to diminish the inflammation by leeches, and the application of a blister; when the pain extends up the arm, attended by fever, twelve ounces of blood should be taken away. If suppuration take place, make a free incision down to the bone. A full dose of opium may be given three quarters of an hour before the operation. Putting the hand in warm water after the use of the lancet, will ease the pain. If permitted to run its course, two months of suffering will be often endured.

Diseased Teeth.—General bad health and various constitutional irritations, without constant pain, often proceed from one or more diseased teeth. No person ought to permit a decayed tooth to remain in his mouth, provided it is found to be too far gone to be plugged, an operation which is earnestly recommended as soon as possible after the discovery of a black spot. The progress of the decay of a tooth, after the appearance of the slightest defect, is gradual but certain. If it be on the side adjoining another tooth, it should be filed out. For either operation a regular dentist should be employed. The sooner it is done, the less will be the deformity, pain, and expence, and the greater the certainty of insuring a continued use of the tooth, considerations all of importance. The too general neglect of their teeth, by persons resident in the country, often occasions an early decay of them. Those unacquainted with the laws which regulate the animal economy, and particularly with the powerful effects produced in the system, through the sympathy of the nerves, may find some difficulty in acceding to the opinion, that one or more decayed teeth could produce disease, or affect the continuance of one, in a part remote from the tooth. Such nevertheless is the fact. It may probably induce many to attend to the caution given respecting the propriety of removing decayed teeth, to state a few particulars on the subject. The incredulous may be prepared to admit the theory, from the well known fact of the alarming convulsions produced in children, by the irritation of the nerves from the pressure of one or more rising teeth from the jaw, against the nerves in the gums. The effects of decayed teeth in adults are not less remarkable. Violent rheumatisms in various parts of the body, epileptic fits, dizziness in the head, long continued and severe pains in the head, intermittent fevers, and partial palsy, and that old complaint *indigestion*, which so many

have recently found to be a new disease, under the fine name of "*dyspepsy*," abscesses in the cheek, and lastly, ulcers in the jaw and chin, attended with a general derangement of the female functions, have all been cured by the removal of one or more decayed teeth. In some cases the tooth, although it gave pain, exhibited no decay.*

Biles.—These are occasioned either by constitutional or local causes. When they are numerous, they are very generally attributed to grossness of the system, or in popular language, to "too rich blood." They do indeed occur sometimes in persons of gross habits, but they also very commonly attack others, who have been debilitated by previous diseases, particularly fevers and dysentery. When purges have been omitted to be given after the small-pox, cow-pox, or measles, they almost invariably occur. When they succeed a general disease, they are commonly but erroneously supposed to be critical, or to be the deposit of the original cause of the complaint, or the last effort of the system, or of "nature," to terminate a previous disease. They are therefore deemed healthful, and much unnecessary suffering is often occasioned by neglecting them.

The local causes of biles are picking off the heads of little pimples, or irritating a scratch or wound made by a knife or pointed instrument. They also often happen without any obvious cause.

It is difficult to disperse a genuine *furunculus* or bile, unless it be early attended to. When, however, they at-

* For the satisfaction of the medical reader who may wish to have more authorities than one for the evils of diseased teeth, I refer to Dr. Darwin's Zoonomia, vol. 1, sect. 25. 2d Dub. edit. vol. 2, p. 169—172—330. Philad. edit. Dr. Rush in Med. Repos. New York, vol. 6, p. 285, and his works vol. 3, 3d edit. p. 349. Sir Astley Cooper's Surgery, p. 6, 7, London 1824.

tack a joint, or appear in any part of the body which it will be troublesome to attend to, the experiment ought to be made, by the application of three or four leeches, and of a thin cloth dipped in cold lead water to the part, and by taking one or more purges; but when it is evident that a disposition prevails in the part to suppurate, poultices of flax-seed, or of bread and milk, covered with oil or hogs' fat, ought to be applied, and renewed twice a day. If great pain attend, a tea-spoonful or two of laudanum may be poured over the poultice. Much pain arising from the distension of the skin may be prevented, and the course of the disease shortened, by a free and early opening of the bile, to discharge the purulent collection, and the gangrenous cellular membrane, commonly called the "core." When from fear of a little momentary acute pain, caused by the use of a lancet, the sufferer delays the operation, or permits the bile to break spontaneously, or will consent only to a small opening, the disease often extends, or a fresh collection of pus takes place. After opening the bile, continue the poultices until the cavity of the bile is emptied, and after the second day, insert a tent of soft oiled linen, (twisted or rolled to a point) in the wound, to prevent its too early re-union. This must be removed at every dressing, and the matter gently pressed out. When the cavity is emptied, apply a simple cerate or balisicon ointment on a soft rag. When a disposition to form biles appears, they may be prevented by taking a mixture of cream of tartar, and flowers of sulphur,* and by drinking freely of an infusion of sassafras blossoms, or root of dandelion.

* Take of cream of tartar one ounce,—flowers of sulphur half an ounce,—molasses (or honey if preferred) enough to combine the ingredients. Mix thoroughly, and take a table-spoonful, three times a day, washing it down with the drinks above prescribed, or water.

Burns and Scalds.—When these are of small extent, ease may be speedily obtained by the application of cold water, of such a temperature as is adequate to the intended object. It is to be renewed as often as is requisite to allay the pain. If the part scalded be the foot or leg, and covered with a stocking, it should be instantaneously pulled off, but if only a minute or two have elapsed after the accident, before any attempt is made to afford relief, the stocking should be cut away, as in the attempt to pull it off, the cuticle will come with it, and greatly increase the anguish, by exposure of the true skin to the air. Ice must not be added to the water, for by the sudden abstraction of the heat of the part, it will cause pain. After the severity of the pain has been allayed, the part may be bathed with a thin rag, dipped in cold lead water, and then covered with Jamestown weed* ointment. If blisters form, they should be opened by a needle, or a very small puncture of a lancet, to let out the water contained in them. Preserve the old skin to defend the part from the irritation of the air, while the new skin is forming.

If the burn or scald happen in winter, or be extensive, the application of cold water would create a chilliness, which is to be carefully avoided. In this case the part may be wrapped up in cotton, and permitted to remain on until ease be obtained: it should then be moistened, and gradually removed, and the part covered with the above ointment, or one of bees' wax and oil, and washed every day with a solution of white vitriol and water, in the proportion of twenty grains to a pint of water.

Hydrophobia.—The disease produced by the bite of a dog, wolf, fox, or cat when mad.

* Corruptly called "Jimson weed." It is the *Datura Stramonium* of the botanists. The ointment is made by mixing the juice of the plant, with melted hogs' fat; or the leaves pounded in a mortar, may be boiled with the fat, and then strained.

Every person who keeps a dog is liable to this disease, and not a year passes without the publication of accounts of deaths from it. To guard against it let the following cautions be attended to:—Avoid all intercourse with strange dogs, or cats. These animals when infected, often bite, without provocation, and without exhibiting the least symptom of disease. A bite received from one of these animals, whether young or old, in the first hour of the disease, and however small, is equally dangerous as a large one, or one inflicted when at its height: nay, cases related on most respectable authority have occurred in the United States, and in other countries, of the disease and death being produced by bites from dogs, while the dogs themselves continued in good health.*

In case of a wound being received, it should be instantly wiped, and washed with soap and water, and then well sucked, either by the sufferer himself or another person. There is not the smallest danger in thus applying the saliva of the dog to a sound mouth, for a wound or a sore are essentially necessary to give activity to the poison. If the wound be large, water should be poured from a tea-kettle on it, for half an hour, and the edges of the wound opened, to give free admission to it: and in every case, ley of wood ashes, or a solution of potash in water, must be afterwards used as a wash. Mercurial ointment should then be rubbed in the wound, which must be prevented from healing for two weeks. The application of caustics to the wound has repeatedly failed to prevent the disease. If a skilful surgeon be at hand, and the part bitten admit of the operation, it should be

* See the Med. Recorder of Philadelphia, vol. 2d, for my paper on this disease. In two of these cases it is not mentioned whether the dogs, at the time they bit the person, exhibited any marks of indisposition. One dog did not exhibit the least appearance of being mad.

cut out, which will effectually secure the sufferer from all danger of future disease. But the surgeon should take care, that he do not inoculate with his knife, the parts below the extent of the wound. After the first incision, therefore, a clean knife should be used.

It may be satisfactory to know that not more than one in twelve persons bitten, are attacked by the disease; but this fact must not cause the neglect of the local means mentioned, for in the United States, every case that has occurred has proved fatal. Wounds received through clothes, are much less dangerous, than those inflicted upon the bare skin, as the poisonous saliva in the former case, would be probably wiped off from the teeth.

In the event of the disease appearing, not a moment should be lost in consulting a physician, and the treatment I advise, is, to bleed the patient while standing or sitting up, until fainting is produced, and if the symptoms recur the operation must be repeated, and to the same extent. The temporary exhaustion from the loss of blood, will soon be recovered from, while death will be the inevitable result of any other known treatment. I do not promise a cure from the bleeding, but it has succeeded in two cases, one in Calcutta, and one in England, and these warrant the use of it, considering the total failure of all other remedies hitherto tried. It is essential, that the blood be lost in the course of the two first days of the disease.* Dogs should be carefully prevented from eating carrion of any kind. The sufferer is earnestly intreated not to trifle with his life by trusting to any of the numerous specifics with which the public have at different times been duped. Their recorded failures prove that they do

* Physicians are referred to the "Medical Recorder of Philadelphia," vol. 2d, pp. 174. 285, and vol. 6, p. 35 for the cases cured by bleeding, and my remarks thereon. The particulars of any case in which this treatment shall have been adopted, with or without success, will be acceptable to the author.

not possess the power, of either preventing or curing the disease. As regards a cure, they make no pretensions: their boasted success is confined solely to prevention, but it is a well established fact, that as many persons who took no remedy have escaped, as those who have undergone a long course of preventive medicines. Even a salivation, long continued, has repeatedly failed.

Bites of Snakes.—Tie a string above the bitten part, and suck the wound. There is not the least danger in so doing, unless the lips be sore; spit out, and rinse the mouth with water. Then use some of the following remedies, all of which have been found successful.

1. Apply ley of wood ashes, or a solution of potash in water, to the bitten part: and give diluted ley, or ten grains of potash in a cup of water, every half hour.*

2. Mr. Mayrant of South Carolina, relates the cases of two negroes cured, by giving Cayenne pepper and whiskey.† In one, the dose was one tea-spoonful, in a glass of whiskey. The three first does were thrown up; the fourth remained, and after more than a quart of whiskey had been taken, the man spoke. This great quantity was taken in two hours. In the course of the night, three quarts were used, but he supposes that one may have been lost, in pouring it down his throat. The next day he gave every hour, spirit of ammonia, and also whiskey and water, with very nourishing food. In another case, he cured a person after giving a quart of whiskey, with red pepper, in ten or twelve hours.

Dr. Ramsay of Charleston, S. C. published the case of a person who was cured by large doses of brandy and opium.

* Dr. Brickell of Savannah. To sheath the acrimony of the ley or potash, it should be diluted with infusion of flax-seed, or gum arabic water.

† Med. Recorder, vol. 6, p. 619.

3. Mr. Williams extols the spirit of ammonia in the bites of venemous snakes in the East Indies. The dose is from thirty to forty drops every ten minutes in water, until relief be obtained. The medicine is also to be applie to the wound.

4. So many cases in the United States have occurred of the efficacy of olive oil, in the cure of the bites of venemous snakes, that it can be confidently recommended. It is to be applied to the bitten part, and taken internally without limitation as to dose; sucking of the wound, and a ligature above it, should never be neglected.*

Stings of Insects.—The pain from the stings of wasps, bees, and hornets, is quickly relieved by rubbing the part

* The following article was taken from the Augusta (Georgia) Herald, a few years since. The popular confidence in the efficacy of plantain in bites of snakes, has long been great in the United States. It is presumed that the broad-leaved plantain is alluded to.

"In a late paper we mentioned the death of a person from the bite of a rattle snake; in conversing with a very worthy and respectable physician on the subject, he informed us, that for forty years he had been in the habit in such cases, of administering the juice of the green plantain, and he never knew a single instance of its failing to afford relief to persons bitten by snakes: he had given it, he observed, when the sufferer was apparently in the agonies of death, and when considerable force was required to open the mouth, and in every case the relief was almost instantaneous. The plantain is to be bruised, and the juice pressed out, and that given to the patient as soon as possible after the bite; but it is never too late to give it while the sufferer is alive; after pressing out the juice, the plantain may be boiled in milk, and also given to the patient. The certainty of this remedy against the bites of snakes, and such venomous reptiles, should induce persons in such situations where those accidents are likely to occur, to cultivate the plantain in their gardens or fields, that a remedy against an accident which may otherwise prove fatal, may at all times conveniently be procured."

with olive oil, or cold ley The sting should be extracted, if possible. Common salt, moistened, and applied to the part, has been recommended from experience, and in a case where a person had been stung on the inside of the throat by a wasp, the alarming symptoms were instantly relieved by swallowing repeated strong doses of salt and water. In some cases of severe attack, a fever was excited, attended with considerable swelling of the part. In such the loss of a few ounces of blood will give instant relief; then apply the oil. It has been recently said, that chalk scraped on the part, will give immediate ease. It is important to know that if a hive of bees should settle on a person, there will be no danger of being stung, if he can preserve so much presence of mind, as to remain quiet for a short time, when the bees may be gently brushed off, or taken off by one accustomed to handle them, and put into a hive.

The bites of spiders are often highly poisonous, and several cases have been mentioned of death being occasioned by them. If the oil does not succeed, apply pounded plantain leaf to the part, and take a few spoonsful of the juice of the leaves. This remedy was announced a few years since in a southern paper, as having succeeded in a very serious case.*

Noxious air of Wells.—The fatal effects of inspiring the noxious air of wells, are so well known, that it would seem almost unnecessary to notice them, but as a year seldom passes without cases being in the newspapers of deaths from this cause, it would be improper to omit a caution on the subject. The deadly agent is carbonic acid, formerly called fixed air. It is a constituent part of the atmosphere, from which it separates and settles

* See the Domestic Encyclopedia, article Plantain; whether the species used, was the one with broad leaves, or that with narrow leaves, was not mentioned. Try the first species.

near the bottoms of wells and vaults. The means of ascertaining its presence, and of removing it, are simple and certain. As the air in question cannot support combustion, it is only necessary to let down a lighted candle into the well, when, if it be extinguished, death will be the certain fate of any one who descends, while, if it continue to burn, no danger need be apprehended. To remove the air, the following plans have been adopted with success:—1. Attach a rope to a pine or cedar-bush, and let it descend to the bottom of the well, passing the rope over a windlass set across the mouth of the well. One or more persons should then lay hold of the rope, and run as speedily as possible from the well, until the bush is drawn out.

2. Attach a stout cloth in form of a scoop-net, to a hoop, a little less than the diameter of the well, and fasten three cords to it, at equal distances from one another, each to be about the length of the diameter of the hoop, and knot their ends together. Let this down the well, by a stout line over a windlass, and taking hold of one end of it, let a person, as in the former instance, run away quickly from the well's mouth. In either way, the creation of a current of air will cause the noxious gas to be drawn up. The experiment should be made twice or thrice, with either bush or hoop, and a candle let down to test its success. It is extremely important to add, that this deadly air is sometimes produced in the course of an hour,* and therefore every morning, during the progress of repairing, cleaning, or digging a well, or after a short cessation of work, a candle should be let down, previously to the descent of a workman.

In case a person should be taken out of a well in a

* An intelligent well-digger of Philadelphia, informed me, that he has often known the foul air to form, while the men were gone to dinner.

state of insensibility, after breathing foul air, he must be immediately taken into the open air, and in a current, if possible, and after obliging every one to withdraw, except those affording him assistance, he is to be stripped, and two or three buckets of water dashed over him, and some of it in his face, his body well rubbed, and his lungs inflated in the following mode:—Insert the tube of a common pair of bellows into one nostril, so as to fill it completely, the other and the mouth being closed: then force air into the lungs by using the bellows, and during the intervals of the different inflations, the air will escape by the mouth or other nostril, and when the lungs are so evacuated, the inflation is to be repeated. To prevent the air from passing into the stomach, a hand should press the windpipe against the gullet. When the breathing is restored, and the heart beats, the person should be put into a warm bath, or a warm bed, and frictions continued. If a disposition to vomit appear, it is to be encouraged by drafts of warm water. On no account must the sufferer be bled.

Remitting Fever, or Bilious Fever.—Where the disease is preceded by the usual symptoms, as languor, loss of appetite, and head-ache, it often may be prevented by a gentle emetic and purge, avoiding meat, and the assistance of rest, a warm bath, or bathing the feet in warm water at night. When the fever and head-ache are severe, twelve ounces of blood should be taken away. The operation should be repeated after a few hours, if the pain do not abate. Cool drink may be freely taken. Avoid sweating by heating remedies, in the commencement of the complaint. The diseased and increased action of the system must always be reduced, before sweating be attempted. The vessels will then pour out their fluids freely, when necessary, by the aid of warm diluting drinks, and of such medicines as are known to determine

to the surface. Tamarind water, or thorough-wort* tea are excellent for this purpose. Frequent purging in this disease is essential to clear the bowels of bile, which forms with great rapidity, and when collected in the stomach, causes a return of fever. For this purpose, three or four grains of calomel should be given at night, and a dose of epsom salts early in the morning, every other day. When the fever continues obstinate, after the loss of blood, and a thorough evacuation of the bowels, with great heat and dryness of the skin, the body should be sponged with cool water and vinegar, which will often "break a fever," that would otherwise prove very tedious. Should the fever still continue, no time is to be lost in causing a slight salivation, by giving three grains of calomel every two hours. The fever will cease as soon as the mercury takes effect. Relapses are to be guarded against by avoiding exposure to bad weather; by occasional purging, and caution in indulging a returning appetite. Much may be done by persons living in sickly countries, or in times of a prevailing epidemic fever, to prevent disease, by taking a dose of Peruvian bark every morning, or by eating breakfast before going out; avoiding wet feet, checks to perspiration, night air, especially during sleep, and a blazing sun.

Fever and Ague.—Is the epidemic disease of a marshy country or district; but it is often produced by exposure to draughts of air when the body is heated, and in a state of perspiration. The proper mode of treatment is an emetic about three hours before the cold fit is expected; then a purge, and finally, the Peruvian bark during the intervals of the disease. A large tea-spoonful may be taken every hour or two in water, or sound wine of any kind. The addition of one clove, and of ten grains of Virginia snake-root, *both in powder*, will increase its

* Or bone-set. *Eupatorium perfoliatum.*

powers. As the stomach often soon nauseates the medicine, it ought to be mixed in a room apart from the invalid, and brought to him at the proper time. He should then swallow it without delay, rinse his mouth with water before inspiring, and chew a piece of bread; there will then be little difficulty in retaining the bark. From thirty to sixty drops of laudanum, if taken upon the first symptom of the cold fit, will suspend or shorten it, but a much more agreeable remedy is the warm bath. This should always be used for children. If the stomach be very delicate, a lump of sugar dipped in compound spirit of lavender, and eaten, will quiet it. A small portion of manly resolution will greatly aid in preventing the stomach from rejecting the medicine. If the bark produce constipation, ten grains of rhubarb may be added to every other dose of it; or if the stomach will permit, he may chew small portion of the root, and swallow the saliva. Those who have an uncontrollable aversion to the bark, may take the sulphate of quinine in doses of one, one and a half, or two grains. A cheaper remedy is "Fowler's solution of arsenic." Six, eight, or ten drops of this medicine may be taken three times a day; one hour after meals, in a wine glass of water, to which a tea-spoonful of the compound spirit of lavender may be added, if nausea should occur. Children to whom the bark is very disagreeable, may take two, three, or four drops, according to their ages, twice or thrice daily; ample experience of this medicine enables me to attest its virtues, and to pronounce it perfectly safe, if not too long continued. After two weeks use it should be omitted, and a dose of rhubarb, or castor oil taken. During its use, the person must avoid taking cold, or being wet. The diet of persons in this disease, must be savoury and nourishing. A change of air, or a journey, often will cure this disease without medicine.

Obstinate cases yield readily to the shower bath, if exercise be taken soon after its use. Weakly persons ought to wear a flannel shirt during the winter subsequent to the season in which they were affected with this disease, changing it regularly once a week.

Cutting a Blood-vessel.—All that can be done, until medical aid be called, is to put a piece of folded cloth on the part, and to apply a bandage; or if the wound be small, to press the thumb and finger firmly upon the bleeding vessel, and sit still, if the wound be in the foot, until a carriage is procured to convey the person home. All medicines to stop the blood flowing from a large vessel are useless. As every person employed with an axe, is liable to this accident, no one should go alone into the woods to cut timber.

Inflamed Veins.—These are sometimes caused by a dull or rusty lancet being used to bleed. The disease is noticed here, from having seen the state of the lancets sometimes used by country bleeders, and because those who employ them are not aware of the danger attending the operation. It also has been brought on, by using the arm freely the same day a vein was opened in it. Two deaths have occurred from this cause in Philadelphia. Medical men ought to be employed to bleed in the country. The remedies are, purging, rest, and low diet. Dr. Physick applies a blister over the inflamed vein.

Bleeding at the Nose.—This is sometimes an effort of the system to relieve a too great fulness in the head, and unless it proceed to such an extent as to induce weakness, should not be stopped. In some young persons it occurs so frequently, as to become very troublesome. When necessary to check the flow of blood, snuffing up cold water will often prove effectual; but when this does not answer, the nose must be plugged. To do this, roll up a piece of linen or cotton to a point, oil it, and then

pass it up the nostril, by a circular motion, until it reach the bleeding vessel, and let it remain for some hours. Persons subject to this disease ought to keep such a plug by their bed side. When the disease attacks growing boys in high health, it may be prevented by an occasional dose of physic, by avoiding severe exercise, and the use of as little animal food as possible: but on the contrary, when it appears in those of feeble constitutions, the diet should be generous, a dose of Peruvian bark taken occasionally to strengthen the system; and a journey of three weeks or a month performed in pleasant weather. The powder of Puccoon or red-root snuffed up, will often check a bleeding of the nose.

Sprains.—Are to be cured by rest, supporting the limb in a position higher than horizontal, day and night, and the application of cloths dipped in cold salt and water to the part. When stiffness remains, the part should be rubbed gently twice or thrice a day with the hand, for ten minutes at a time, a few drops of sweet oil being previously applied to the hand. If the ancle be the part affected, laced boots should be worn to give a mechanical support to the joint, and muscles covering it, after the person is able to walk.

Hooping Cough.—Give an emetic, and afterwards a purge of calomel and jalap. To cut short the course of the disease, let the child change the air every day or two; and if, as is sometimes the case, the cough be very distressing, apply a burgundy-pitch plaster three inches broad, half way down the spine, from the nape of the neck. The part must be first wiped dry, and the edges of the plaster snipped to make it lie smooth. As this is commonly a trifling disease in children, and a serious one when it attacks persons grown up, and no one can expect to escape it, children should be exposed to those who have it, when between ages of one and four, or five years.

Spitting of Blood.—The bleeding may be checked by taking a tea-spoonful of dry fine table salt, and swallowing it slowly. If there be fever or cough, or the pulse very quick, four, six, or eight ounces of blood should be lost, and rest enjoined, with light diet. In the winter, avoid exposure to cold and damp: wear flannel next the skin, and warm stockings, and stout shoes, or over-shoes. A veil is a great protection against the cold, for weak lungs.

Cholera Morbus.—A violent vomiting and purging. This disease most commonly proceeds from errors in diet, either as regards quantity, quality, or outrageous mixture of food. A new article of diet, eaten at supper in summer, often produces it, such as clams, lobsters, and crabs. The offending cause must first be removed by drinking warm water to promote vomiting, and when the stomach is clean, thin corn-meal gruel salted should be taken to assist in the evacuation of the bowels. If cramp in the legs come on, they must be well rubbed with a cloth dipped in whiskey. If the person feel fainty, warm wine sangaree may be taken. The bowels being well evacuated, twenty, thirty, or forty drops of laudanum may be given, to promote sleep, and quiet the agitation of the system. The next day or day after, a dose of magnesia, or castor oil should be taken to evacuate the bile which will probably be discharged into the stomach or bowels, and which, if retained, might renew the disease.

Catarrh or Cold.—Persons in town and country are alike subject to this complaint, and the attention is particularly called to it, because of the disposition of mankind to neglect it, merely from being able to attend to their business while labouring under it. At this time the foundation may be laying of a serious or long protracted indisposition. A cold, or influenza (which is no more than an epidemic catarrh) however severe, may be cured in a few days, provided the patient will at once agree to make

the attempt. The process is, to take a dose of epsom salts, or castor oil; if fever be present, to lose twelve ounces of blood, to lie in bed, drink freely of warm flax-seed tea, sweetened with honey, and abstain from meat. Lying in bed is essential to a speedy cure, for a free perspiration, which mainly contributes to throw of the disease, does not take place, when the person is clothed and sits up, although in a warm room. The cough may be assuaged during the early stage of the disease, by liquorice root, or lemon candy or molasses candy; and after the bowels have been well opened, by the addition of five or ten drops of laudanum three times a day, and thirty or forty drops at bed-time. At night the feet should be bathed in warm water. By this simple treatment the patient will be cured, and enabled to return to business in one week; while others, who for fear of being made too delicate, permit the disease to take its course, will continue to be distressed by it for weeks, probably lose their voice for some time, and finally, be forced to confine themselves, a much longer time, to be relieved of a more serious complaint. Costiveness from the use of laudanum, must be guarded against, by an occasional dose of castor oil.

Vegetable Poisons.—Alarming illness and frequently deaths have occurred from different wild vegetables being eaten, either raw, or boiled as a substitute for others, which every farmer ought to cultivate in his garden.

Last year two melancholy cases were recorded. One happened in one of the N. England states, and another in Cumberland Co. Pennsylvania. In one case near Carlisle, where it abounds, that virulent poison the wild parsnip, and in the other, some plant taken for wild cicely were eaten. Every year cases of disease occur from eating poisonous mushrooms. Beside these last (a numerous tribe,) there are twenty-one native plants in Penn-

sylvania, which are known to be poisonous, if either externally applied, or internally taken; more may be doubtless found in different parts of the continent.* The youth of a family ought to be cautioned against eating any wild plant, the quality of which they are ignorant of. After the offensive substance has been discharged from the stomach, strong coffee, and brandy, or whiskey diluted with water, should be given to settle the stomach.

The plant emphatically called poison-vine, or poison-creeper, (rhus radicans) which is universally diffused over this country, poisons some persons by merely remaining a few minutes in its vicinity: or by being exposed to its smoke when burning. The symptoms produced are, swelling of the face, hands and arms, or feet, and a painful eruption on the skin. The usual remedies are annointing the parts with cream, or washing them with lead water. Dr. Dewees informs me, that the best remedy he ever used, is strong mercurial ointment. If any watery pustules form, they must be opened with a needle, and the water absorbed by a soft cloth.†

* The *datura stramonium* obtained the trivial name of Jamestown weed, (corruptly Jimson) from the circumstance of a number of English soldiers having been poisoned after eating the leaves boiled. This took place soon after the settlement of Virginia. In Charleston, S. Carolina, a child was last year killed by eating the flowers of the fragrant yellow jasmine, (*Bignonia semper virens.*)

† Mercurial ointment ought never to be made with the assistance of turpentine, to promote the extinguishing of the mercury, as such ointment invariably produces inflammatory pimples on the skin, and would increase the disease produced by the poison vine. Mr. W. Anderson of New York, the Amer. editor of that excellent work, Cooper's Surg. Dict. says, that the preparation of mercurial ointment will be greatly expedited by rubbing the mercury in the first instance with a small proportion of goose grease. One ounce of this article will be sufficient, with rubbing, for the space of one minute, to make the globules of the quicksilver entirely disappear, and render it at once fit for

The seeds of stramonium, or Jamestown-weed are often eaten by children, and are highly poisonous. The symptoms are convulsive motions of the arms and legs, yawning, loss of power over the lower limbs, dilated pupil, red eruptions on the skin, and swelling of the body, indistinct articulation, and constant catching at objects. The remedy is an emetic, to produce powerful vomiting. If the first do not succeed, a second must be taken. If several hours have elapsed before the use of medicine, a purge of fifteen grains of jalap and ten of calomel should be given. After the discharge of the seeds, five, ten or fifteen drops of laudanum, according to the age of the child, should be given to quiet the system.

Mineral Poisons.—Arsenic is the only one likely to cause mischief, from the imprudent use often made of it, under the name of rats-bane, to destroy rats. It ought never to be used for the purpose. When it has been swallowed, twenty grains of white vitriol should be given, (not tartar emetic) to cause vomiting, and then whites of eggs freely taken. Sugar and water should then be drunk freely, followed by a purge of calomel and jalap. Avoid milk and oil.

Swallowing Fruit-stones.—From carelessness or hurry in eating, stones of fruits are often swalbwed whole. Cherry stones are even sometimes knowingly swallowed, from a mistaken notion of their assisting the digestion of that fruit. The practice is highly dangerous, and should always be avoided, as alarming obstructions, and inflammation of the bowels have been the consequence of it. Death has not unfrequently happened from this cause,

admixture with the proper proportion of lard. The utility of rancid sweet oil for the same object, as recommended by Delauny,* has been fully proved in Philadelphia.

* Tromsdorf's Journal of Pharmacy, vol. 8, p. 152.

without suspicion being attached to the true source of the calamity, nor could relief be given even had it been ascertained.* If those who thus wantonly trifle with their health, knew the structure of the alimentary canal, they would easily comprehend the force of the caution, and avoid the practice which is the ground of it.

Eating Black Cherries.—Several cases have occurred in Philadelphia, of death having speedily taking place in persons who have eaten freely of black cherries, and drunk cold water soon afterwards. Not knowing the particular state of the system at the time, I cannot pretend to say whether the coldness of the water may not have had some agency in the production of the evil effects that followed; but the number of cases that have occurred, ought to serve as a caution on the subject.

Persons walking through fields of grain, or timothy grass, ought to avoid the common practice of stripping up the heads and eating them: more than one death is recollected to have occurred from this cause, owing to the seeds, husks or beard of the seeds being suddenly drawn into the windpipe, and producing suffocation.

The synovia or "joint oil" of the big toe, will sometimes collect in undue quantity, and cause a puffy tumour, which when pressed by the shoe is acutely painful. It is to be cured by making as small an opening as possible to admit the discharge of the glairey fluid, by gentle pressure. The wound is then to be instantly closed to prevent the admission of air to the joint, which would cause inflammation. It is then to be covered with sticking plaster, and a linen or cotton compress bound on the

* I allude to the death of a promising young man, who had just entered upon the sacred duty of a preacher, from an inflammation in the bowels, caused by a bean slipping into the *appendicula vermiformis.* This note is inserted for the information of the medical reader.

part, to cause an adhesion of the sides of the cavity. It is essential, that the foot be kept at rest on a chair for at least one month, as exercise will infallibly cause a renewal of the disease, and an inflammation of the joint.

Clothes Catching Fire.—Women should instantly lie down, and smother the flame by rolling the carpet, or some other woollen article around them. Children in like manner are to be enveloped in the coat of a man, or the folds of a woman's gown, if of worsted; water, if necessary, may then be applied. Persons using the spirit or oil of turpentine, must avoid approaching within five feet of a fire, or collection of live coals, or a candle, as the vapour will take fire. All children should be clothed in worsted clothes.

Lightning.—1. If caught at a distance from home, avoid taking shelter under trees; instances every year occurring of cattle, sheep, and men being killed by lightning, or dashed to pieces by splinters of wood, when flying under trees, to avoid being drenched with rain. If a person has a gun or iron tool with him during a thunder storm, he should leave them on the road, or in the field, as the iron will attract the lightning, and he will be inevitably killed. A late English paper, (June 1824) mentions that a shepherd in England, who was returning from his daily labour in a thunder storm, carrying a fork across his shoulders, was instantaneously killed by lightning, which doubtless was attracted by the prongs of the fork.

2. During a thunder storm, while at home, collect the family in a close room having no fire place: no instance having fallen within the knowledge of an inquirer on the subject, of a person being killed in a close room.*

* This fact was first stated to the Boston Academy of Sciences, by the ingenious Benjamin Dearborn of Boston, in the year 1807.

Persons struck with lightning are to be stripped, and have cold water dashed on their bodies, and sprinkled in their face. Friction with coarse cloths are to be applied, every time after the use of the water.*

* It is singular, that few farmers when they build a house or barn, will incur a little additional expense for a lightning rod to preserve them from destruction : of those which are erected in town or country, very few are properly constructed. For this reason, the following directions by the author, are here inserted from the Agric. Almanac of Philadelphia, for the year 1825.

1. The rod should be made of iron, and it will be the better for being round and smooth; the several pieces composing it must be neatly welded together, and the top formed into a moderate point, and tinned to prevent rust, which destroys the conducting power of iron. Where the tinning cannot be done, coat the point with black lead, and as this will be washed off in time, it must be renewed when necessary. It is still better to make the point of the metal called platina, as that will not rust, and requires no further attention when once fixed.*

2. For a dwelling-house, the rod should run up the side or end, so as to project four or five feet, at least, above the chimney, because the heated and moist smoky vapour in the tunnel of a chimney having, a fire on the hearth will act as a conductor to the electrical fluid. To shew the importance of this caution, it may be mentioned, that most of the accounts annually published, state the circumstance of lightning passing down chimnies into houses: and the chimney of a house at Purfleet in England was struck, although a rod was affixed to another part of it. In a building without a chimney, the rod should be placed on the west side in preference, because thunder storms commonly come from that quarter.

3. The rod is to be fastened to the wall by iron clamps or staples; and the lower end of the rod should enter a stream of water, or the earth two or three feet; then go six feet from the wall, and then be bent downwards three or four feet, to prevent damage to the foundation. Where a house is about to be built, the rod ought to be the first thing prepared, as it can be easily inserted in the ground (when the cellar is dug) to a depth to

* These points are made and kept for sale by Isaiah Lukens of Philadelphia.

Danger from Exposure to Cold.—A carelessness with respect to this cause of disease, has often produced se-

insure its reaching moist earth; a point of essential importance to insure a speedy dispersion of the electrical fluid. It will not answer to let the end of the rod merely touch the top of the ground, nor to let it rest on a rock, even although it should be a foot or two under the surface, because in neither case will the electrical fluid be certainly carried off. Houses thus partially protected, have been injured by lightning. About three years since a place of worship in Massachusetts was struck, that had a conductor just touching the ground, and Mr. Thomas Leiper's house at Crum Creek was shattered, several years since, notwithstanding he had two conductors to the house, both of which rested on rocks a few feet under ground.

4. The lower end of the rod ought to be coated with a paste of black lead,* to prevent rust, and also be surrounded by a bushel or two, if possible, of charcoal, coarsely pounded and moistened.

5. There must be two conductors to a building when it is more than 40 feet long; one at each end, and these ought to be firmly connected by a rod, or strip of lead, lying on the roof; because the quantity of electrical fluid in the cloud passing over one end of a building, may be greater than the rod there can carry off; and hence the redundant portion will spend its force on the house; whereas, if there are two rods connected, the lightning will be divided between them, and the house be saved. Besides, if there be only one rod, the charged cloud may pass over that end of a long building to which no rod is attached, and there cause havoc; such cases have happened. The house at Purfleet was struck, although a rod was attached to the ridge, only 46 feet distant from the corner where the lightning spent its force; and a few years since, near Philadelphia, one end of a tanner's frame bark house, 70 feet long, and having a rod at the other end, was also struck and the house consumed.

6. Additional security would be obtained by having the water-spouts made of copper, and by forming a communication between them and the rods, carrying an iron or copper rod from the lower end of the spouts to moist earth, or into water.

* This may be done by powdering the black lead, mixing it with melted sulphur, and then applying it to the rod while hot, as recommended by Mr. R. Patterson, late President of the American Philosophical Society.

rious acute illness, or laid the foundation for tedious chronic complaints. Many persons have an impression, that such exposure is necessary, and particularly praise worthy in young persons, to render them hardy; and a reference is sometimes made to the Indians, who dress lightly in winter, to prove the harmlessness of cold; but those who use this argument should reflect on the difference between the original stamina of savages, their manners and habits, and uniformity of life, and those of civilised society. To be consistent, and to give the argument weight, they should imitate the savages in all things regarding their modes of life, but as this attempt would be impracticable, we must cease to quote them, and act agreeably to the constitutions we have acquired, and to the circumstances in which we are placed. Let persons, therefore, in civilized life, however hardy they may be, guard against the effects of severe cold: and if unfortunately exposed thereto, let them as soon as possible prevent the effects of it. When after such exposure, a limb, or any part feels numb, it should be rubbed with snow, or immersed or washed in cold water, which will cause a gradual return of vital heat to the part. Avoid approaching the fire, or remaining in a warm room for some hours, for either an inflammation of the part, or severe rheumatism will be the consequence. The application of the simple remedy of the fat of poultry, has been found highly beneficial as a local application, and after the use of cold water or snow, should not be neglected.

A head-ache should never be trifled with; in young persons it is the first symptom of a violent fever, and in those beyond the middle stage of life, it is the precursor of apoplexy, and its common attendant, palsy. Timely and sufficient evacuation of the bowels, the loss of blood, proportioned to the vigour of the patient, and force of the pain, together with rigid abstinence and quiet, will often prevent both complaints.

From motives of economy, animals that have died of malignant diseases, are often skinned before they are buried. The act is attended with so much danger, that it ought not to be attempted. Several cases have occurred in the United States, of death from this cause, owing to the absorption of the acrimonious humours of the dead animal, by the person engaged in the operation. The danger is greatly increased, if the fingers or hand be scratched or cut while covered with the moisture of the dead animal. An account of some deaths from this cause has recently been published,* and many more are on record. In case of a wound, scratch, or prick, from either a bone or knife, being received, however small, by a person while skinning or dissecting a dead animal, the part ought to be instantly well washed with ley of ashes, or with soap and water, then sucked for a minute or two, and a string tied above the part, as long as it can be borne. If the hand be in pain, apply pledgets of lint dipped in laudanum and lead water, to the wound, and as far up the arm as the pain extends. Should matter form, no time is to be lost in giving vent to it by the knife, to prevent the injury which will follow its confinement. Keep the hand in a sling, and give opium to procure sleep, and diminish pain, and constitutional irritation. As great debility will take place, the strength must be supported by wine, and porter, or ale. The bowels must however be opened by a dose of calomel and jalap, or rhubarb.

* Dr. Kercheval of Bardstown, Kentucky, relates the history of a disease that was propagated among a number of persons who had flayed some cattle, which had died of a disease attended with inflammatory swellings, ending in gangrene. See Med. Recorder, vol. 4. Mr. Huzard, inspector of the French veterinary schools, observes, that no carcases putrify so quickly, and emit such dangerous exhalations, as those of herbiverous animals, as the horse, the ox, &c. He has seen numerous fatal instances of this poison among the veterinary students, when they happen to wound themselves in dissecting these animals.

Mill-ponds and low swampy places near a house, have often produced fevers of a malignant cast, or bilious remittent fevers, which have proved fatal. Intermittent fevers of an obstinate character, have arisen from the same cause, and by producing obstructions in the liver and spleen, have proved extensive sources of permanent ill health. The wet places should be drained, late in the autumn, or during the winter. Many mill-ponds might be dispensed with, by the use of horse power to grind grain for family use; and a small steam engine would obviate the necessity of overflowing many acres of land, to obtain a water power. The expense of erecting one, has now ceased to be an objection. The right to make a dam by drowning an extensive surface of land, is a just subject for legislative interference, and as in the case of the erection of a bridge, or laying out a road, ought to be decided upon by the local authorities, to whom such measures are usually referred.

In clearing wet land, it is of great importance to drain and dry it thoroughly, before the trees are cut down, as the inevitable consequence of an exposure of the wet soil to the action of the sun, will be the production of highly noxious effluvia, followed by fevers or dysentery.

Care should be taken to prevent exhalations of decaying vegetable substances, in and about the house. In Virginia, a mortal fever was occasioned, a few years since, by exposing to the sun, a quantity of cedar or cypress shingles, which had been stored for some years in the cellar of the dwelling-house; and a similar fever was more recently produced in Delaware county, Pennsylvania, from the decaying timbers and putrid water in the cellar of an out-house.*

Accidents and complaints, apparently of a trifling nature, often prove very serious in the end, and sources of

* Many other cases of a similar nature might be quoted.

great suffering. As in war, "discretion" is often "the better part of valour," so in the human system, a little attention to a small injury, may prevent a great evil. Knowing the disposition of many to neglect themselves, from an absurd notion of not appearing effeminate, and of a manliness of character being shewn, by this inattention to small injuries, I am induced to notice the subject.

More than half the deaths from consumptions, proceed from neglected catarrhs, or as they are commonly called, colds. Neglected felons or whitlows, and fear of a little acute temporary pain from an incision, which may be necessary to cure that complaint, cause weeks of suffering, and often the loss of a joint. Cases of lock-jaw and gangrene, have proceeded from cutting a corn on the toe: and eighteen months confinement, with great pain, from permitting the nail of the great toe to grow down into the flesh. Sir Astley Cooper* relates the case of one death from cutting a toe nail to the quick, and another from puncturing a bunnion on the toe with a lancet: gangrene took place in both instances. Lock-jaw from running a thorn or nail in the hand or foot, has already been treated of. A neglected inflammation in the eye, has often ended in a film over the pupil, or in a cataract. Other cases could be quoted, but enough has been said to shew the propriety of the advice given.

Some cautions on the subject of family medicines must be given. No medicine should be kept in open drawers, or in closets used for the purposes of the family, for fear of their being swallowed by children, but exclusively in a box or drawer having a lock and key. This advice is founded upon a knowledge of such accidents having happened.† Nor should any medicine be kept, without its

* Lectures on Surgery, vol. 1, London, 1824.

† A child in Philadelphia, very recently swallowed two ounces of laudanum: and the newspapers within a few months, have recorded the death of another child, from having obtained access to a bottle of rum, of which he drank half a pint.

name being marked in plain English characters. The remains of unknown compound medicines, when partially used, should be thrown away. Laudanum must be given in a bright state; for when thick, the dose is doubled or trebled from the solid opium suspended in the liquid, and the deaths of children have been caused by the use of such turbid laudanum.

Bites of Snakes, additional, see page 231.—While this sheet was at press, I met with another record of the efficacy of the liquor of ammonia, (spirit of hartshorn) in the case of a child, apparently near dying, by Mr. Burchell, while travelling in South Africa. Ten drops were given in water, every five minutes until relieved. The medicine was also applied to the wound after being scarified, with his penknife.* In the year 1822, the uniform success of the external and internal use of the same remedy, during eighteen years, was stated in the newspapers, on the authority of Dr. Joseph Moore, of Gibson Port, Mississippi. I ought to have mentioned before, that I was informed when in Georgia, several years since, of the cure by it of a negro, who had been bitten by a rattlesnake.

* Travels in Southern Africa, vol. 1, p. 392, London, 1822.

Instructions for the cultivation of the Mulberry Tree and of Silk Worms, in order to introduce them into America. By the late Paul Busti.

Read September 19th, 1824.

It is not at all necessary to observe, that the name of *worm* is very improperly applied to the insect which furnishes silk. It is by no means a *worm*, but in the rigorous acceptation of the word, a caterpillar. However, before treating on this subject, it will be proper to make some observations on the cultivation of the mulberry tree, as the leaves of these trees furnish the nourishment of these caterpillars. There are several kinds of mulberry trees, but I will mention only two of them, namely, the black, and the white mulberry. As experience has proved that the white mulberry is preferable. I shall limit myself to the describing the manner of raising and multiplying it. There are two methods of multiplying these trees, namely, by the seed, and from suckers. To proceed with the first, there are two ways. Choose the finest fruit from a tree, perfectly sound, loosened by a slight blow given to the branches, when the fruit is perfectly ripe; and having prepared the ground by the spade, plant the seeds at the distance of three inches from each, covering them lightly with earth, on which it will be proper to spread a light covering of soot, plaster, or lime, as much to hasten vegetation, as to guard it from ants, and other insects. This operation is done in Italy in July, at which time the fruit of the mulberry arrives at maturity. The season being generally more backward in America, it is possible that to defer it till August would be necessary. In general,

in eight or ten days after the sowing the little trees begin to shew themselves. The second way, is to plant in the spring, the seeds which have been procured the summer preceding. To have them good, the best fruits are to be chosen. Let them ferment for some days, after which, infuse them in cold water: in rubbing the fruit between the hand, the pulp dissolves, the false grains float on the water, and the good sink to the bottom of the vessel. These last are gathered to be rinsed in fresh water, after which they are left in the shade to dry, to be used in planting the nursery in the following spring. Mulberries are also propagated by cuttings, like many other trees, either by placing in the earth the branches attached to the original trunk, confining them with forks, and cutting them when it is perceived they have taken root, or by tying a piece of brass wire around a branch at the time the tree is in sap, and cutting it, at the second running of the sap, below the circle produced by the brass wire. It is from this circle that the roots shoot, when the cut branch is placed in good ground. It should be observed here, that in Italy the mulberry is wild or cultivated. It is known that every tree coming from the seed, or cuttings of a wild tree, preserves its wild character. The wild shrubs grown in the nursery, are cut off six inches from the ground. A branch is chosen of equal size with the trunk on which it is desired to perform the operation. The bark is taken from the trunk, and the part thus stripped, is covered by a piece of the bark taken from the cut branch, and from which the wood is taken out.

When the sap of the tree is in full activity, the execution of this manœuvre is very easy, because in twisting with the hand the bark from the branch, it detaches itself without difficulty, or injuring the shoots with which the bark is covered. Much care however is to be used,

so that the bark taken from the trunk, and the other fastened on the naked wood, unite exactly. To prevent the air from penetrating the place where the barks unite, or from entering by the truncated end, it is plastered over with clay, or some other adhesive matter. The spring being very late in America, and the winds from the north-west cold, I advise all to use every means practicable to retard the hatching of the silk worms. For this end, it will be useful to keep them in a cool place. It is important that the mulberry trees should be partially covered with leaves before the eggs of the worm are broken, as the moment the caterpillars appear, they require something to feed on, and during the first days after they appear, if the mulberry leaves are not in plenty, it is necessary to substitute lettuce leaves. Common sense tells us that if the animals do not at once obtain the aliment which nature has destined for them, they suffer from the want, they become sickly, of a weak and tender body, which cannot be amended or corrected by good treatment. This appears to me so important, that I would advise that during the warm days of March and April, before the mulberry is in leaf, the eggs should be kept in a very cool and dry place: the coolness can be increased by placing the plates which contain them on pieces of ice. The moment the presence of the leaves will warrant you to expect the possibility of furnishing the caterpillars with nourishment, freely expose the eggs to the action of the external air. They hatch soon, but with more or less inequality. As the worms hatch, they follow their instinct in searching for food. To prevent them from wandering in useless searches, place on the eggs which begin to hatch, some mulberry leaves. You will see them attach themselves to the leaves. Take these leaves covered with little worms, and place them in boxes, and continue the same operation until all the

eggs are hatched. This taking place at intervals of days, and even weeks, it will be very useful to appropriate several boxes to dispose of the worms, observing to place in the same box, all those which are hatched in the space of three succeeding days. It is necessary to assort thus the worms of the same age, to facilitate the treatment which they require, as they increase in size. As soon as the leaves covered with worms, are placed in their boxes, it is necessary to spread before them other leaves cut very fine, and three times a day to furnish them with fresh nourishment. The quantity must be regulated by the number of the worms, and by the degree of appetite which they shew. Any excess in this point is hurtful: too little prevents their growth, and too great abundance only causes a number of the worms to be lost in the remnants of half eaten leaves, which, forming a thick litter under them, prevents them from coming out. During the first four days, the quantity of nourishment furnished them increasing, on the fifth, it will be proper to be a little more liberal, as at this period, the insect, which feels the time of its first moulting approach, at first eats a great deal, and after a little time, seems to tire of food, and at last ceases to nourish itself, and to pass into that state of torpor, which I shall call moulting. During its continuance, which is only for a day, the insect remains motionless, and it is only after having changed its skin, that it resumes its former activity. When it is seen that most of the worms had revived from their state of torpor, they must be furnished at first with leaves cut, and scattered about on account of their visible growth, and as it is important to keep them clean, in removing the litter and dirt, it will be proper to give them entire leaves, and even little branches of the mulberry. They naturally give the preference to these small cuttings, and by facilitating the means of displacing them,

will offer an opportunity to clean the boxes well, without being obliged to touch the insects. Observe the same plan with the first and second moultings, in gradually increasing the nourishment of clipped leaves, until the fourth day, when the insect will again fall into its state of torpor. When they have revived, feed them well with leaves cut fine, over which it will be necessary to repeat the operation of spreading leaves, and small branches, so as to again remove them to clean the boxes. The removal and cleaning finished, give them more cut leaves, increasing at every time the quantity, until on the fourth day, you will observe their appetite to fail. This is the certain signal which indicates the time of the third moulting. At the fifth time, you will see them in the torpor or sleep as before. They revive from it with a very voracious appetite, which must be supplied, as in preceding cases, with cut leaves and branches, so as to remove them, and to clean the boxes. Their appetite, after this third moulting, continues till the fifth day; on the sixth following, it begins to diminish, and at last ceases all at once. The worms suffer the same changes as they experienced before, and for the last time fall into torpor, and molt. At their revival, give them entire leaves and branches. To clean the boxes it will be useful to substitute perforated tables. Continue to feed them abundantly in this manner during the five days which follow this last revival, and do not diminish your liberality until the sixth, when the worms begin to show not only a distaste for the leaf, but to give signs, that the time has arrived for them to make the cocoon. The change of their colour announces the maturity of age, which they have attained, and the elevation of their heads will be the certain sign that they are near the period: on observing these certain marks of the proximity of your harvest, attach to the sides of your frames, branches of dry

bushes, on little sticks of any wood you please. Be careful that these branches or sticks are neither too close nor too open. In the first case, the worm will be embarrassed in its moments of fastening the first threads of the cocoon; in the second, the too great distance will prevent their fastening them.

The cocoon of the silk worm is perfectly finished only at the end of five days, and this can be ascertained, by the degree of resistance which it offers when touched by the finger. A more certain mark is, that of shaking the cocoon, for if the worm has finished its work, and changed into a chrysalis, the cocoon will give a sound. But these means of discovering the maturity of the cocoon, as well as by the other trials, have inconveniences. The risk is incurred of spoiling the cocoon, by interrupting the enclosed insect by the pressure or shaking. These trials are besides superfluous; use and practice will teach us to distinguish with an observing eye, the perfect cocoons from those which are not so. Besides, we can judge from the length of time the worms have been working. In gathering your cocoons, use baskets, taking care however not to entangle or mix them, for the weight occasioning the pressure on the chrysalis, will destroy the cocoon.

Journal of the progress of the Silk Worms. 1824.

May 4th. The weather being good, and promising to continue fair and favourable to the full development of the mulberry leaves, the rags and papers on which the nits laid last year remained, (closely preserved in tin boxes,) were laid out in the frames of the nursery. They weighed seven ounces, rags and papers included. The day before, Mr. Samuel Alexander gave me some few silk worms of his own raising in town, which having been fed on lettuce leaves, had a poor look. I substituted mulberry leaves, and the change for the better was soon visible. Judging from the size and colour, I am led to believe these little animals have undergone the first change of their skin this morning seventh of May.

May 10th. In the early part of the day, the worms began to hatch. It would seem, that the dawning of the day, is the propitious hour for the birth of these worms. The young brood have been placed in separate drawers, with a ticket marking the epoch. I shall follow the same system, in order to be strict in keeping separate the worms according to their nativity.

May 12th. The weather continues fair. At 7 o'clock, found a copious quantity of nits hatched.

May 13th. Few worms have come out; in the afternoon of yesterday no collection of them was made. A very copious quantity came forth this morning, and has been gathered. The weather, fine and mild during the day, changed at sunset to windy and cold.

May 14th. A frosty night with high wind has checked the hatching of further nits.

May 15th. The continuance of cold preventing the increase of worms, few appeared in the morning. During the day a moderate quantity appeared.

May 16th. The same raw weather had the same effect upon the nits. The worms collected this day, terminate my collection, and limit the quantity of silk worms I shall raise.

N. B. It would have been desirable to know the weight of the nits hatched. On a common grocery scale the original weight was nine ounces, afterwards it was found reduced to eight ounces. I am tempted to presume the nits hatched, must weigh more, since the empty shells remaining on the rags and papers, still made part of the eight ounces. If next year I shall be permitted to try again the raising of silk worms, I shall scrape off the nits, and weigh them in an apothecary's scale. There is no other way to ascertain the true result of a stated weight of nits in cocoons. According to information from Italy, the result is various there, like that of all agricultural produce. It has been intimated to me, that from an ounce of nits the crops of cocoons amounts to sixty to eighty pounds, each of twenty-eight ounces.

May 16th and 17th. The weather and temperature of the air has been such, as to force the kindling of fire in the apartments of houses. The thermometer, during these days, never stood higher than 56°. Clouds and fogs obscured the sky; there was not even a quarter of an hour of sunshine. This undoubtedly checks the worms in their growth, and prevents the regularity of their operations in life, so minutely observed and described by naturalists, and to keep up which, the Italian raisers of silk worms have adopted the various and expensive methods described by Count Dandolo. I deem them useful in accelerating the crop of silk, but superfluous for improving it.

May 17th to 22d. During all these days the weather has been variable, but on the average, cold and damp. On the 20th, we were forced to light again the fire in the house.

I am now made perfectly aware, that my mode of raising is exceedingly defective in an essential part, viz in letting the nits stick on the rags. The hatching is thus so unequal, that even of those from which I took the first worms on the 11th, a great proportion of nits are yet unhatched. Thus it is pretty evident that the Italians act more wisely in scraping the nits from the rags, and collecting them in boxes. The equal degree of exposure and heat of which the nits are susceptible in this way, must greatly contribute to a regular hatching of the nits laid at the same time. The improvident way I have pursued, made me lose a good deal of my nits.

The inconstancy of the weather as to cold and warmth, has been very great during these days. On the morning of the 27th, the air was so keen, an hour before the rising of a bright sun, that the thermometer stood at 43° in my piazza. In the nursery it would have stood lower, as the building is by far more exposed, and open to the air. This fact was evident by its effects. All the silk worms on the different frames were in a torpid state from cold. The leaves spread to them the evening before, were untouched, and as fresh as if they had been just given them. Such variations in the atmosphere render it impossible to trace with accuracy, the stages of their progress in life: for I do not see how a person can distinguish when the worm remains inactive, and does not feed, whether it proceeds from cold, or from the laws which nature has dictated to his mode of existence. With close buildings, and the addition of fire places or stoves, I conceive it practicable to raise silk worms in any uniform and equal progress.

I do not aim at such operations. I intend to prove to farmers, how easy it is to raise silk without expense, and with little trouble. Therefore I continue my adopted plan of entrusting to nature my success. Notwithstanding the coldness of the nights, I suffer the upper window of my nursery to be open.

May 28th. This morning at six o' clock, the thermometer stood at 43°. The worms on every frame looked benumbed. They had left untouched the leaves given last night.

May 29th. To day, finally, the warm season opened. The thermometer at six in the morning stood at 64°, the worms were active, and so voracious, that treble the quantity of leaves hardly were sufficient to their appetite.

May 30th. Some of Alexander's worms began to crawl up the bushes to spin. Owing however to some hidden cause, abandoning the bushes they ran away in quest of other places. I presume this was occasioned by my having used for bushes, the green branches of the mulberry trees, from which the leaves had been taken off.

May 31st. The night has been pretty cold, and the thermometer stood at 56° early in the morning. All the worms were benumbed by cold. I changed the bushes given to Alexander's worms, and substituted myrtle branches.

June 2d. The change of the weather has been very extraordinary; the thermometer which stood yesterday at 68° in the morning at five o' clock, and raising to 90° during the day, was this morning down to 50°, and never went higher than 62°. It made a stop to eating by the worms.

June 3d to 13th. Damp and cold, sunshine and heat succeeded one another without interruption, during these days. The worms followed these changes, benumbed

and active according to the atmosphere: at times they were torpid, at others voracious. Among those hatched the 10th of May, few began to spin. I hastened to make the bushes round the frames, after having increased their number with twelve more.

June 15th to 30th. Notwithstanding the season has proved rather cold and damp, during the two last weeks of the month, the worms grow so much in size, that I was under the absolute necessity of adding as many new frames as the building could contain, and even to obstruct the passages between them with ten of half the dimensions. This growth of the worms beyond all ideas I could have entertained, was the cause of many errors in the directions I had prefixed to myself to follow.

1. The quantity of leaves I had meant to consume in feeding doubled, I was obliged to send for them twice a day to old Stile's farm. The distribution of food on so many frames could not be attended to by me personally. I was forced to give it over to playful girls and boys. At one time the worms were super-abundantly provided, at others badly supplied.

2. My precaution of keeping divided the worms of different ages, became useless. The multiplication of frames required the removal of the worms by many hands, none of which could or would pay attention to the original divisions. Hence worms first hatched, were mixed with those hatched last.

3. The haste wherewith the bushes were raised along the frames, did not admit of their being placed in the best manner. Besides, having not been able to find broom corn, I have been forced to use corn brooms, short and tied. These brooms did not offer to the worms convenient spaces for spinning. The intermixture of untied stable brooms, remedied to a certain degree this evil. All this has occasioned a great diminution in my crop. It

appeared evident at the time of clearing the frames from the litter, that the chickens, sharper-eyed than any human being, were attentively watching at the doors of the nursery, and picking worms out of the litter thrown out. Many worms creeping up the bushes, finding no suitable place, crawled on the top of cocoons already made, and wasted their silk on them. Others resting on frames spread it on the flat pasteboard, &c.

In a word, I may boast of a pretty good crop of silk-wool or plush. This arises principally from a cause, which on account of the mixture of worms of every age was unavoidable, viz. the fear that the early spun cocoons should not be pierced by the butterfly, which made it incumbent to pick them from the bushes. This operation of course caused many of those lately begun on the top of the old ones to be injured.

Crop of Cocoons.

July 1st. The parcel collected yesterday, after having been exposed to the fumigation of brimstone, weighed thirty-one pounds. Average weight 306 cocoons to a pound. Mr. Hutchins informed me that *his* stock obtained from 1500 worms, weighed thirty pounds. I weighed out this day, second of July, 33,160 green cocoons as a second parcel of my crop. From this weight however, is to be deducted the one of 800,* which by a mistake of the servant, were added to those dried in the sun which had been counted. Twelve pounds of third crop were picked the third of July.

N. B. *For want of assistance the second picking of

* Mr Busti's method of fumigating the cocoons with brimstone is not a *safe* one; his experience proves it, but the cause he seems to be unacquainted with. The most safe and effec-

cocoons smoked with brimstone in the morning, remained in the tub till the following one. In spreading them out to the sun in order to dry the larvæ, I was surprised to find that many butterflies had come out. Not a single one was discovered among the cocoons of the first picking, which immediately after the fumigation were exposed to a burning sun. From this I may infer, that the brimstone smoking has little or no effect in killing the larvæ, and that the heat of the sun's rays does it effectually. In proof of this, I can assert that the few butterflies which made their appearance on the second picking, died very soon after their exposure to the sun.

tual mode of killing the chrysalis, is to *bake* the cocoons in an oven, made pretty warm, but not so hot as to *scorch* when tried with a sprinkling of flower. If the oven be not warm enough, instead of killing the chrysalis, it will only bring them forward the sooner. So it is with fumigations of brimstone; hence Mr. Busti's method not being effectual, the flies were hastened through the cocoons. S. Alexander.

On the importance of Irrigation. By Samuel Hains.

Philadelphia, August 6th 1825.

Read, August 16th, 1825.

Sir,

The great scarcity, and consequent high price at present of butter, vegetables, and other articles in our market, reminds me again most forcibly, of the benefits that would result both to town and country, if the practice of irrigation was introduced within the limits from which these articles are chiefly collected.

I have often wondered, since you and I first conversed upon this subject, that among the numerous well written essays on various subjects connected with agriculture, no one has entered into an examination of the advantages that would be derived from irrigation.

Cast your eye upon a map of Pennsylvania, and within a range of thirty miles around this city, you will see one of the best watered districts in this country; a district closely intersected with numerous streams of the finest water, most of which I know from actual levels taken in various directions, have their sources at an elevation of from 300 to 500 feet above the level of the tide. The great elevation from which these streams flow, besides being favourable to a great supply of water, afford an opportunity of spreading it over a great extent of surface.

Within the limits above mentioned, and from which a great portion of our small articles for market are produced, I have no hesitation in saying, there are 50,000 acres of good arable land over which water might be com-

manded at pleasure, if the farmers would unite in an arrangement to convey it from one farm to another, furnishing each by turns with a copious supply two or three times a week.

I had an opportunity of seeing the good effects of an arrangement of this kind in the Island of Madeira, where, although no rain falls from the month of May to October, the finest vegetables of all kinds are produced in abundance by means of irrigation. Channels for conducting the water are made at great expense, and carried over the roughest grounds for miles together : the distribution of the water (I was informed) was fixed and regulated by the laws of the Island ; similar regulations connected with irrigation exist in different parts of Europe.

Irrigation is one of the most ancient practices connected with agriculture ; and in some countries even at this day, is deemed of the first importance, and without which their population could not be supported.

In the early settlement of this country, and for nearly a century afterwards, farms were valued in proportion to the quantity of land capable of irrigation. In offering a farm for sale or rent, during that period, no man ever forgot to mention, that it " contained so many acres of watered meadows," and that "more might be made :" but since the introduction of plaster, and red clover, watered meadows are almost wholly neglected, particularly in the farming districts nearest the city, where, above all others, the practice ought to be continued, and if properly managed, would be immensely profitable.

It is worthy of remark, that in many remote parts of this state, particularly those settled by Germans, and their descendants, watered meadows are highly valued. I am informed, it is a prevailing opinion among them, that the disease called *slavering* in horses and cattle, does not occur in those fed on the hay or grass from watered mea-

dows, and I am inclined to think there is truth in the opinion, for I remember well when the disease was unknown in the neighbourhood where I was brought up, viz. a few miles this side of Downingstown: hay was then seldom made from any other, than ground occasionally overflowed with water.

It is an erroneous opinion, that spreading water over land renders it unfit for the plough, or growth of grain. It is in many situations the cheapest method of enriching and restoring worn out lands than can be resorted to, and upon a dairy farm its advantages must be incalculable.

In the climate of our country, experience shews, that we may regularly look for a period of great drought between the months of June and October; the present season is another proof, that however abundant and seasonable the rain may be in the fore part of summer, and however cheap, and plentiful, butter, vegetables, and other things may be in the early part of the season, yet a few weeks of dry weather will have the effect to double the price upon the consumer, while the articles are of inferior quality, and scarcely to be had in the market.

There is no way of counteracting the effects of drought so effectually, as by spreading water over the lands. Every kind of grass, grain, or vegetable may be improved or preserved by a skilful application of water; even fruit trees may be benefitted, and the fruit improved by it. The quality of butter, as well as the quantity in dry seasons, is greatly improved upon watered meadows: and garlic, and many other weeds so injurious to the dairy, are lessened or wholly destroyed by irrigation. The practice which prevails in our country of draining the lands, with a view to get rid of the water, as though it were a nuisance, is attended with injurious consequences, particularly in a dairy farm. Cattle and live stock of most kinds requiring free access to water in dry warm

weather, and the quantity drunk is much greater than most people imagine; for milk cows, it ought to be clean and cool, if possible, during summer: very few dairy farms in the neighbourhood of the city, are as well provided as they ought to be in this respect.

Strangers, particularly those from France and Germany, in passing through our part of the country, while they see much to admire in the management of our farms, must be struck with surprise at our neglect, I might say contempt, of those beautiful streams of water with which almost every farm is supplied. In the rapid progress of agricultural improvements, the uses to which they might be applied, seem to have been overlooked: the time however is approaching, when they will be carefully improved, and their skilful management rank among the chief cares of the husbandman.

Philadelphia must be the greatest manufacturing, and consequently the most populous city in the United States: it has increased to its present size by regular and steady steps; it will continue so to increase, until its inhabitants shall be double, treble, or fourfold the present number. It is surrounded by a fertile country capable of furnishing within a reasonable distance, abundant supplies for a population four times as great as it has at present, and this at moderate prices, provided the means are used which a bountiful Providence has furnished. To effect this, it is true, great and important changes must take place in respect to the gardens and dairies within the reach of its market: at present, some of the most fertile spots in the immediate neighbourhood of the city, are so wretchedly managed, that where the richest grasses, fruits and vegetables ought to grow, and where milk and butter, sweet and of the finest flavour, ought to be produced, you will see nothing but weeds, or at most a little meagre oats or buckwheat, and for fruit, a few scattered half decayed

trees producing apples without flavour, peaches, pears, and cherries, that never ripen but in the huxter's basket.

Our city claims a decided preference, in fuel, water, and many of the substantial necessaries and comforts of life. Our flour, beef, pork, and poultry are equal to any in the United States, if not superior: a great portion of the articles furnished from our dairies and gardens are excellent, but a great portion is of inferior quality; the supply moreover is not regular, for in the early and rainy parts of the season, the market is inundated, and so little regard is paid to the quality, that many articles are sold which are unripe, unsound, and unwholesome, and ought not to be suffered to come into the market; while in the dry seasons, the supply is scant, and the temptation to sell, with the necessity to buy is so great, as to give vent to many articles which ought never to enter the door of our dwellings.

The best way to prevent inferior articles from coming to market, is to promote a supply, and give a marked and decided preference to those of good quality: the first may be attained by improved methods, and a strict regard to correct principles in their growth and management; the second by strict police regulations in the market.

Among the means that might be devised for improving the produce of the dairy and garden, and rendering their supply regular and constant, irrigation stands pre-eminent. Lands may be manured, and judiciously divided, the exact time of planting may be known, the best kind of seeds, the best cattle and stock may be provided, but in a drought these avail nothing: "when the ground is parched, and the clouds give no rain, the hopes of the husbandman lie prostrate."

A copious stream of pure water issuing from an elevated source, is of inestimable value to the farmer, if pro-

perly managed; but like every other valuable article, it requires great skill in using it to the best advantage. In Europe, much ingenuity and talent have been employed on the subject of irrigation; the engines for raising water, canals for conveying it, and the time and manner of spreading it over the ground, have been studied with great care and brought to great perfection. In this country we have much to learn; facts might be collected in abundance to prove, that much good has been effected by it, and it would also be easy to show, that much evil has arisen from its neglect.

Whenever irrigation comes to be succesfully used, it must be first under the direction of men experienced in the art; water used at an improper time or in a slovenly manner does more harm than good. I remember to have seen a few acres of meadow, over which spring water was judiciously spread, produce three crops of good hay in one summer: the water was collected in a pond, and passed rapidly over the ground at stated periods. The best method of watering gardens and orchards, is unknown in this country, although it has been partially and successfully tried in some instances within my knowledge. The nature of our climate, and the increasing demand for fruits and vegetables of good quality in our market, will compel our farmers to study and practice irrigation from the same necessity, which forty years ago compelled them to learn the best method of collecting and using manures.

In many parts of the country a strong prejudice exists against irrigation, lest it should by increasing soakage and evaporation injure and destroy the mills. This I think is a mistake, for the absorption would go to replenish the springs, and the evaporation would soon descend in showers: nothing is lost; the greater the surface of water exposed to evaporation in any country, the greater and more

frequent will be the showers. I take it therefore to be sound reasoning, that irrigation would increase, rather than diminish the streams of water.

There is no branch of business connected with agriculture, more pleasing and instructive, or from which more useful hints might be drawn, than in raising, conducting, and spreading water over a farm. There is certainly no subject, in my opinion, that can more profitably and usefully engage the attention of the *Philadelphia Society for promoting Agriculture.* "This great and beau-"tiful city," falls more particularly under your guardianship, than that of any similar society in the state; that your society are earnestly engaged in promoting its prosperity, no one ever doubted, and should this essay afford a single idea in aid of your laudable purpose, I shall be highly gratified that a few moments of time have been employed so usefully.

I am very respectfully,

SAMUEL HAINS.

Dr. James Mease.

[Mr. Hains may be, commendably too zealous in his opinion of *Philadelphia* becoming the *greatest* and *most* populous city in the United States, though the chances are much in its favour. But there are the strongest reasons to believe, that it will be at no distant period, both great and populous, in proportion to its increase of supplies from remote regions of our state; brought by internal transportation, improved or created by the laudable spirit, now generally spread among our citizens, to promote cheap and effective communications with our city, by roads, canals, and internal navigation of our numerous rivers, hitherto most lamentably neglected. No state in our Union affords more materials for manufactures, and inviting objects of commerce, either in raw or manufactured condition: and if commerce cannot be profitably employed in one, it will be inevitably engaged in the other. Mr. H's description of the coun-

try in the vicinity of our city, is, with but few exceptions, regretfully true; and, as he alleges, "great and important changes" must take place, adapted to the demands induced by a growing population, accelerated by circumstances now in incipient progress Let grain, and the hitherto common commercial articles of this kind, be brought, in ever so great abundance, from distant places, the lands within reach of indispensable and perishable supplies, must be devoted to the daily wants of a large city; and most of them cannot be brought from great distances. The objections, unreasonably fostered by theoretical foreboders, that the lands near the city, will depreciate when remote supplies of field culture glut our markets, are contrary to all experience in Europe, and will so be found here. The most encouraging *facts* could be produced, to prove that cities and population increase, and towns grow into cities, as the means of subsistence are in plenty. Those means are necessarily in demand, as cities extend, and population, of course, increases; the one stimulating and inducing the other. It can be indubitably shewn, by incontestible evidence, that lands in the immediate neighbourhood of such cities, rise in value, with a rapidity which sets at nought all specious adverse anticipations.

R. Peters.]

On Soiling Cattle. By Israel W. Morris.

Green Hill Farm, Delaware Co. (Penn.)
8th mo. (Aug.) 15th, 1825.

Read September 20th, 1825.

LEST I should be thought incommunicative, or disposed to withhold any little experience I may have attained in agricultural pursuits, I sit down in compliance with thy request, to note for thy perusal, such parts of the system I have adopted, as I believe from our conversation, will most interest thee.

My household farm contains about forty-five acres of arable and grazing land; and what is generally understood by a rotation of crops, is the system pursued in its cultivation.

My stock has been, the present season, sixteen cows, a bull, one yoke of oxen, three horses, (two of which are more used for family purposes than those of the farm) a yearling colt, five breeding sows, a boar and five barrows; for all which I pursue the system of soiling, until my hay harvest is nearly completed, by which time I find it necessary to turn out to pasture, as I have never attempted any succession of food by cropping for them, with a view to continue the system throughout the season. I endeavour to have my stock carefully and regularly fed while soiling, five times in the day; say they are stabled for this purpose, at five, eight, eleven, three, and six o'clock each day, and they are perhaps in the stable nearly or about an hour each time; the remainder of the day they are kept in the barn yard, in which is a shed

for shade, and which also has a stream of water running at one side of it. The stable is uniformly kept clean, and the barn yard shoveled up daily; the manure from both of which is hauled into an adjoining yard to a heap, on which being spread, it is immediately covered over with a layer of loam, to prevent exhalation and loss, which I consider would be the effect of the action of the sun's rays upon it. Attention to this part of farming, has been with me a grand desideratum, as my object has been the improvement of the farm without foreign aid, by the purchase and hauling of manure from a distance, considering it more economical to gather up, and save at home, under additional labour, than to purchase, and have a team employed upon the road. I also escape the bad habits too frequently acquired by those so employed, in frequent stoppings at the taverns, believing it a part of the duty of one having others in his employ, as much as can be, to guard them from temptations to vice of any kind; and much, very much depends, I apprehend, upon the faithful care of the head and master of a family in checking that great evil, an attachment to strong drink. It has been a part of my system to keep this evil aloof from my premises, and by furnishing my hands nutritive drink, and frequent diet, during the warm season, and more particularly during the season of harvesting, I have been favoured to get along with more real satisfaction, than I believe would have been experienced by a different course; but to return. In the early part of the season for soiling, (which commences with me about one week after the usual time for turning out to pasture) there is no difficulty in supplying my stock with such grasses as they very freely eat: but in the advanced state of the grasses, my cattle become more dainty, and I serve them from different fields, as I find them most freely to partake of it; and that part of the field first cut

from, is clothed with a luxuriant second growth by the time I find it necessary to change the system, and turn out to pasture, which serves them till the growth in my other fields has sufficiently progressed after mowing, to turn into their regular order. By this mode of procedure, in addition to the increased stock maintained upon the farm, (compared with the plan generally pursued,) and consequent increase of manure, by mowing all the fields, the weeds and trash of all kinds are more effectually kept down. I have also within myself additional help, on which I can rely for getting in my grain crops, the system of soiling requiring an additional hand on the farm while it is proceeded in, but which with me invariably ceases as mentioned with the hay harvest, and during that, its labour is lessened by using the grass as cut for hay, in the soiling. For soiling, I have sufficient grass cut and hauled in, early in the day, while the dew is yet on it, for the use of that day, and the succeeding morning's first feed, being careful not to trample upon it, and in loading, that it should be done without having any person upon the cart, which I found very much to injure the grass for the use of the cattle.

To sum up the advantages I have conceived to arise from this system, they are, an increased stock, increase of manure, which I can apply when and where wanted; an efficient hand in the laborious season of harvesting, before occupied in the soiling, and not always readily obtained at that season, if then to be sought for: more ready and complete destruction of noxious weeds, &c.: and I consider it of importance, in the early part of the season, while the soil is yet open and loose from the effect of frost, to have it kept free from the trampling of cattle, the effect of which must be to harden it, and retard vegetation. Opposed to all this is the additional expense of labour incurred during the time of soiling, but

this I believe to be more than remunerated by the manure saved. Again, the cows do not milk so well as if turned out to good and free pasture; but it will be recollected, the same number could not be maintained in that course of procedure, and I estimate the quantity received at least equal to what it would be under such a course. I may add, that sustenance is afforded upon the farm for double the stock it could maintain a few years since; but at present, in common with my neighbours, I am suffering from the prevailing drought, and see no other prospect but very shortly being obliged to resort to feeding for its support.

ISRAEL W. MORRIS.

Dr. James Mease.
Philadelphia.

Account of a Contagious Disease propagated by a drove of Southern Cattle, in perfect health. By James Mease, M. D.

Read, Sep. 20th, 1825.

In the Address which I delivered before this Society in January, 1817,* I alluded to the singular circumstance of a drove of cattle, which, while enjoying perfect health, spread disease among all other cattle with which they mixed, and I promised to give a more full account of the facts on a future occasion. In the month of August of the year 1796, I was on a tour for the recovery of my health, and having called at Anderson's ferry on the Susquehanna, I found the people of the house in great concern on account of the death of some of the cattle, and sickness of others, which had occurred in a few days after a drove from the south had left the place. Upon inquiry I was informed, that the drover merely requested and obtained permission, to confine his cattle for one night in a ploughed field, and I was assured, that the stock of Mr. Anderson had no intercourse with the drove, which after staying all night, pursued their journey in the morning to Lancaster. There, several head were disposed of to different persons, and in every instance, as I was informed, they communicated disease to the stock with which they mixed. The admission of a single head was enough to give rise to it. As the drove of cattle exhibited no mark of illness, the mystery of the cause was inexplicable, and is so to this day. They stopped a day or two near to Downing Town, thirty-two

* Memoirs of the Soc. vol. 3, Introd. xxxix.

miles from Philadelphia, on the western turnpike, and soon after, the field they occupied, received another drove which had been purchased by the late Mr. Strickler of Columbia on the Susquehanna. It consisted of 260 head, and as I was afterwards informed by Mr. S., had been purchased by him in Maryland, in the vicinity of Hagers Town, and between that and the Cove mountain. Sixty of this drove were sold by Mr. S. near the billet in Montgomery county, the greater part of which died. Several others were sold at the Middle ferry on the Schuylkill, eight of them were bought by the late Isaac Coates, above Downing Town, and all died. Some taken to Germantown shared the same fate. Part of the South Carolina drove was sold at the Blue-Bell tavern, a well known sale-place for drove cattle, and of these forty-six head were purchased by Messrs. Weed and Holstein who then rented the meadows on State island, (where I then resided as Lazaretto physician) and were mixed with near 270 others, a part of which had been purchased, half fat, in the month of June preceding. In about four days after the southern cattle had been turned out on the meadows, they were brought up to the yard round the barn, to be branded, and after remaining there a few hours, they were returned to pasture. The disease first appeared after a few days, among the cows in a field near the barn, and which were regularly milked in the yard used to confine the southern cattle until branded, and in a pair of fine working oxen, which were regularly and daily fed and yoked in the same yard. Several other cattle were successively attacked, to the number of at least twenty, all of which except one died. All those purchased half fat in June, died. My advice being asked, I went to the field where several of the cattle lay ill, and was told that the first symptoms were loss of appetite, and weakness of the limbs, amounting to inability

to stand. When they fell, they would tremble and groan violently. I saw several in this condition. Some discharged bloody urine, others bled at the nose. The bowels were generally very costive. Upon being opened, the kidneys were found inflamed, and sometimes in a state of suppuration, and the intestines filled with hard balls. I prescribed strong purgatives. To one I gave two ounces of calomel, in sweet oil, on the second day of the disease; but without producing any evacuation. Bleeding was tried, without success. The blood was in a state of decomposition, and did not coagulate. As a preventive I recommended smearing the nose, horns, forehead, hoofs, and tail with tar, to counteract the contagion of the disease, by creating an artificial atmosphere around the animal, and also the obvious expedient of an entire separation of the old stock from the strangers. None of the southern cattle died. The circumstance of the cattle from a certain district in South Carolina infecting others with the disease above alluded to, has long been known, but the precise locality, or its extent, I have not as yet been able to ascertain, notwithstanding my inquiries on the subject. The country of the long-leaved pine has been said to be the native place of the infection, but with what certainty I am unable to say. The cattle alluded to, are said also to emit a peculiar smell, which is easily perceived on a warm day, and to be well known in South Carolina.

The useful deduction of which the foregoing statement admits, is a caution in respect to the mixing northern and southern cattle, without the performance of a kind of quarantine by a strange drove, before they are permitted to associate with the stock already on the farm. It may serve to enlarge our ideas on the subject to mention the fact, of disease having frequently taken place, upon the mixture of healthy sailors or soldiers from dif-

ferent climates, in the same vessel, or some camp. Some cases in point were referred to, in my address before quoted, and others of a similar nature are on record, affording proof of the existence of the same laws in the animal economy of man and brute animals. In the event of a disease occurring in future, from the cause above assigned, I would recommend an early and thorough evacuation of the bowels by a mixture of castor oil and molasses, and then the use of the cedar-berry drench as used by Mr. Harrison. See p. 92 of this volume. If the berries cannot be procured, drenches of an infusion of black snake-root tea,* may be substituted. This medicine is mentioned by the late Dr. Barton† as having been used with success in the bloody murrain in North Carolina; and in this volume, p. 88, Mr. Wayne has recorded a cure by it, combined with purges, in that disease, the near alliance of which, with the one I have described, appears to be great.

* Actea Racemosa.

† Materia Medica of the United States, 3d edit. p. 9. Philad. 1810. Dr. B. doubtless obtained his information from those who had witnessed the powers of the plant in the disease.

On the Cultivation of Ruta Baga. By Joshua Gilpin.

Kentmere, (Delaware,) Dec. 2d, 1822.

Dear Sir,

When you lately favoured me with a visit here, you may remember I shewed you a field of Ruta baga turnips, which I have since gathered, and I now state to you the result, with my experience upon their cultivation.

Having attended to the subject some years in England, where I was struck with the very beneficial effects of the culture of this plant, I determined to make myself so far master of it, as to pursue it here; accordingly, on my return, I commenced it in the Spring of 1816, and have steadily continued it since, with such deviations only, from the English practice, as I have found necessary to suit it to our climate; in which all the difficulty attending it consists, and as I am convinced that the cultivation of the plant generally, is as beneficial here as there, I think it important that the distinctions should be well ascertained, by attention, perseverance, and comparison of sentiment between those persons who concern themselves with it.

I shall begin with the seed I use, which is altogether of my own raising, and though it has been said that it degenerates in cultivation here, I have not found that to be the case, as you will see by a comparison of the seed and root, both of which I now send you.

I began originally with seed bought in England from a person on whom I could rely, and it proved very good: but as I know great attention is requisite there to procure

good seed, and that the failure of the crop is frequently to be attributed to the want of it; I determined when what I had was exhausted, to raise it for myself. Accordingly, in the Autumn of 1819, I planted out in my garden upwards of fifty turnips, the best of that year's growth, in rows about two feet apart, with the same distance between the plants; and in the following March I set out an equal number of roots (which had been kept in the house) in the same way; both these settings came to full maturity, and produced good seed, though the Autumn plants ripened one month earlier than those of the Spring, viz. the one by the last of June, and the other not till the last of July. The Autumn sowing was also more productive, and I think better seed than the other, though both were good, and having found no material difference between them in the succeeding crop, I mixed them together, and have used them so ever since, viz. in 1820, 1821, and now in 1822, when their produce will sufficiently attest their quality.

Knowing that every thing depends on having the ground well prepared, I have invariably ploughed and harrowed it in the preceding Autumn, at least once, and in some instances twice, rolling it each time. Here I must remark, that the soil upon which I have operated, was a gravelly loam, totally exhausted by cultivation, so much so, that in some instances where I have planted Indian corn upon it, it hardly produced five bushels to the acre; the turnips therefore were in most instances the introductory crop, in the course of amelioration; and derived no advantage from any preceding one, but the preparation of the soil, where they succeeded Indian corn of the preceding year, which I have found an excellent preparative.

Whatever was the preparation in the Autumn, I ploughed the ground again in the Spring, early, and again, pre-

vious to sowing it. In one or two instances, I put one hundred bushels of well burnt oyster shells mixed with earth, and the ashes burnt with them, to the acre, but I have not found this attended with any very beneficial effects upon the turnips, though it has admirably assisted the succeeding crops.

When the ground was prepared, I sought a proper time for sowing, in the choice of which, the success of the crop, and the distinction between the culture here, and in England, chiefly depends.

My first crop in 1816, was sown in May, and was a very good one: after which I changed the time of sowing till the early part, the middle, and latter end of June, or early in July: but I think, in all these instances, I have had to sow it over again once, twice, or three times, and even then it was attended with some failure. The fact, as I have found it, is, that the plant requires a moist soil to give it a substantial commencement, before it experiences our hot suns, which, if they come early after sowing, destroy the seed, and its early germs: but if it acquire a substantial growth, it is afterwards so hardy, as to live through the heats of July and August, till it meets with the cool nights and dews of September, when it begins to flourish, and continues to grow till the hardest frost.

As I found that when sown in June, even in moist weather, it was almost invariably overtaken by a hot spell of weather, before it could attain its proper strength; and I had no fear that the plant would run to seed during the present year; I determined to revert to the time of year at which I first began, and accordingly I sowed it again on the 27th of May last.

My mode of cultivation has been almost invariably the same every year, that is, the ground being well ploughed and harrowed, I strike out furrows at the distance of

thirty inches apart, into which the manure is filled from a cart, at the rate of thirty common two horse loads of good dung to the acre ; the plough then returning, throws the furrow from each side ; so as to form a ridge (rather flat than high) immediately over the manure, and upon the crest of this, the hand drill is run with the seed, while the ground is fresh ; over this it is the English practice to run a heavy roller on two furrows at a time, the horse or horses walking between them, at once to cover the seed, and break the clods. I have also used the roller for three years, but I found my soil so exceedingly apt to bake, especially under our hot summer suns, and withal that, if there were spaces requiring to be sown again, it was difficult to break up the furrow, that I have this year used a small light harrow with handles, to cover the seed, running it lengthwise with the ridges, and so as not materially to reduce them.

I will here remark, that the best mode of getting in the turnips expeditiously, is to collect upon the occasion one man with a plough, first to lay out, and afterwards to cover the furrows, a couple of carts with hands to put in the manure, and one person on foot to run the drill ; though where men and horses are scarce, the furrows may be first opened, then filled and covered, drilled, rolled or harrowed by the same person and horses in succession ; care, however, should be taken to finish what is begun the same day ; the chief disadvantage in this mode is, that it is not so expeditious, and if bad weather occur, there are intervals in the growth of different parts of the same field.

The drill I use is one I brought from England, worked by a wheel in front like a very light wheel-barrow.

After sowing, the success of the crop rests upon thin-

ning and cleaning the plants, for which, as many hoeings both by the hand and horse are to be given them as necessary; these soon become familiar to persons who are used to the culture of Indian corn, and they are certainly simplified by the drill mode of planting, which shews itself here to uncommon advantage, the furrows being easily kept clean by a horse hoe, fluke, or common plough, while the plants standing in one line, and so evenly dispersed by the drill, are never so crowded as they are apt to be in the broad cast mode, and of course are thinned with a degree of ease and regularity which the latter does not admit of.

On the 17th of June, my plants being about four inches high, I gave them their first dressing; this I have usually done with a fluke, the front tooth of which is ten inches broad, and as it casts the furrows both ways, is the most expeditious mode: but my present field being stony, to avoid throwing the stones on the plants, I used a light one horse plough, and ploughed off the plants, after which I hand dressed them and thinned them to ten inches apart, and on the 8th of July, I ploughed the furrows on the plants, and hand hoed them the second time, which now becomes very essential, and requires great attention, not only to weed and enliven them with fresh earth, but to prevent the earth accumulating on the plant, for if it is suffered to cover the root, it will never grow large.

I should have repeated the ploughing and hoeing if necessary, but I did not find this to be the case; the plants acquired such a growth in July, that their leaves extended so as to meet in the rows; and they pretty effectually mastered the weeds themselves: we all know what an unusual dry summer the last one was, and how long and severe was the drought, to which both weeds

and plants were forced, in a great degree, to yield: I found at least the first not so troublesome, and the last were a long time arrested, so that they did not increase; but they stood the season admirably; few or none of them died, and as soon as the cool evenings of September came on, they put forth with fresh vigour, and have continued to flourish ever since, with little further attention.

I have ever found the greatest growth of this plant from the middle of October to the middle of December: that moderate frosts improved it, and that though arrested, it was not injured by the severest. I have usually suffered them to remain in the field till Christmas, the chief disadvantage of which is, the loss of the tops, and the difficulty of getting the turnips out of the ground when hard frozen. Some of my neighbours have left them in the field all winter, taking their chance of thaws to gather them as they wanted them; this, however, I consider as a slovenly practice, for, though the turnip is not materially injured, it becomes dirty, and there is far greater waste than when it is regularly collected, and housed in moderate weather. This I experienced last year, when my crop was caught by hard frost, so that I did not get it in till an open spell occurred in January, and though it served my cattle, a great deal was lost from the difficulty of getting people properly to attend to the work in heavy cold fields, or to the plants cut in the cold state in which they were brought in.

My decided opinion therefore is, that the crops should be always taken up and housed before hard frosts, and while it can be done with ease; the tops are a great aid to the decaying fall pastures; and if the crop is brought in by degrees, so that the roots may be cut off and housed, and the cattle consume the tops, it is the most economical mode. I prefer bringing the crop to the barn, and the

cattle to the yard to feed in racks out of doors, as the manure is then left in its proper place.

There is no difficulty in keeping the Ruta baga: my uniform practice has been to leave the roots as they are cut in a dry state till a proper time occurs for putting them up, which I do, by placing as many as may be wanted for some weeks in a good cellar, where they will not freeze or heat, and the rest in heaps or hogsheads, covered with straw and earth, in a place convenient to the barn yard. In each of these heaps I place an equal quantity, of ten bushels, that they may be taken out at once, and last for a given time; or if I make one large heap, it is with separations of straw, so that one parcel may be taken out without injuring the rest.

One of the most beneficial effects of the turnip culture is to prepare the land for grain, which it does admirably, both by the manure it takes, and the fine clean state in which it leaves the soil; but it is generally so late a crop, as not to admit of winter grain, so that the most usual crop sown after it in England is spring barley. I speak thus of its lateness, generally, because it has its exceptions, of which the present year is a remarkable instance. I find that it has been remarked by many, as well as myself, that all the productions of the present year have been very forward, which has been so much the case with turnips, that I found mine quite ready to gather by the first of November, so that I had time fully to house them, and sow the ground with wheat, which was put in the 8th of November, and now looks very promising.

The second object of turnips is as a green winter food, for cattle, a great fattener of them, and the source of a great quantity of manure. I do not speak here of the English practice of feeding turnips on the ground, because this appertains rather to raising of sheep, to the culture of the common turnip, and particularly to some

particular extensive districts and soils, (as those of Norfolk for instance) than to the improved culture of turnips, generally and especially that of the Ruta baga.

We have not yet those extensive flocks of sheep which require to be wintered in this way, besides which, I doubt whether our climate would admit of it; the more usual modern mode is to haul all the turnips, and feed them with straw in the barn yard. As the amount of the crop is to be ascertained early in the winter, if it is more than will feed the existing stock, store cattle are purchased, either lean or half fed, the last of which are fully fattened by the turnips and straw, and the first so far improved, that in the spring the one is sold to the butcher, and the other soon finished on the early pastures, while altogether a vast quantity of straw is converted to manure.

I have never been able to go farther in my small way of farming, than to feed my own stock, to give them the advantages of green food, and to save my fodder or hay till the spring. I have accordingly given my turnips in conjunction with straw, corn blades, or hay, to all my cattle, and in this way I have fattened some to kill, and fed the milch cows, and kept the stock altogether in excellent order, without any meal or corn, and with a far less quantity of hay than I should otherwise have used. The quantity I use in feeding, is for the fattening cattle of about 5 cwt., to begin with half a bushel at morning, noon, and evening, that is, one bushel and a half per day, increasing, when they feed heartily, to two or two and a half bushels, with cut straw or fodder morning and evening, and hay at night, the cattle being always kept in the stall, and watered, and well supplied with litter, and cleaned. To the milch cows I give a peck at each feed, once, twice, or in bad weather, when they do not leave the stalls, three times a day with straw fodder or hay, though in good weather, they walk the

barn yard, and have some fodder put into racks to brouze upon. To the smaller stock, calves, &c. I give perhaps half a peck a morning and evening with straw, &c.

With respect to the taste which turnips give to milk and butter, and which forms an objection to their use, I have not found it to arise from the Ruta baga (though it certainly does from the common turnip) at least in any offensive degree; if it did, I believe the application of a little saltpetre dissolved and put in the milk in the manner used with turnips in England, and now well known here, would effectually remove it. In other respects, the Ruta baga gives much of the appearance and quality of May butter.

In England, varieties of turnips are raised, as is well known, particularly the white and yellow Norfolk, the Scotch or yellow Bullock, &c. all of which are the favourites of particular districts or people; in some instances one sort exclusively, in others many of them together: and indeed varieties may be useful where turnips are raised to feed upon a large scale, as the early feeding may be begun with the early turnips, tops and all, which continue very good through the month of December, when the yellow turnips, which are certainly more hardy, come into use, and these are succeeded by the Ruta baga, which last through the Spring.

I have myself cultivated several kinds of white and yellow turnips, particularly the white and yellow Norfolk, Scotch and yellow Bullock, and common white turnip, all with good success as to the produce, but I prefer the Ruta baga, as I think they are a more certain crop, and infinitely more lasting. As a proof of their extreme hardiness, I have found some of those which have borne seed, still fresh at the root, and one which I boiled for curiosity, nearly as good as before it was planted out. I must remark, however, that none of the field turnips are pro-

per for the table, for which the small white turnip sown in August is to be preferred. Unfortunately, this year, all the white turnips I have sown in the field have perished, and a small patch in the garden proved very bad in quality.

You are aware that the produce in England is enormous. The quantities mentioned by Dr. Anderson in his essays, and by others, would not have been believed, here, but for the respectability of their vouchers, but nothing like them has been produced here, though we can scarcely judge what can be done, until our lands are brought into the same high state of cultivation, and the same attention is paid to the object. My produce this year has been from one hundred to one hundred and sixty bushels to the acre, of fine well grown Ruta baga: this year I have had one hundred of very good quality, and when the poorness of the soil, the extreme drought, and the produce of part of the same field in Indian corn, not exceeding five bushels an acre, are considered, I think it is not unreasonable to conclude, that if the ground was in such order as to produce a good crop of Indian corn, or other grain, it would produce several hundred bushels of turnips.

Dr. James Mease.

Account of a Small Crop of Pennsylvania Cotton. By Philip Tidyman M. D.

Roxborough, July 1st, 1823.

Read, October 21, 1823.

Dear Sir,

I have been prevented by a variety of unavoidable circumstances from acknowledging the receipt of your's of the 19th of last month inclosing a resolution of the "Philadelphia Society for promoting Agriculture," requesting to be informed of the expense of raising cotton, with the treatment and supposed amount of crop per acre.

In order to give the culture of cotton in the State of Pennsylvania a trial, I directed that half an acre of land in a rough state in my orchard should be ploughed up and harrowed; this was accordingly done in May 1822. The ground was laid out in beds, about fifty to the half acre, and four feet apart from the centre of one to the other; a peck of black seed was planted in a part of the ground, and in the other part consisting of little more than a quarter of an acre, a peck of green seed was sown, much in the same way as the common garden pea, trenching lightly with the hoe and dropping the seed about an inch apart; the time of planting was on the 7th of May, and a sufficient quantity of seed was reserved to re-plant in case of frost. I returned to my residence near Germantown about the 26th of May, and found notwithstanding the arid and sterile state of the soil, the plants were growing luxuriantly, and had from two to four leaves; I suffered a week to elapse that they might acquire a little more vigour, and then commenced thinning them; this work was resorted to for a short time in the

afternoon from day to day, and when the seventh or eighth leaf appeared, I made a final thinning, leaving the plants at the distance of four feet from each other. A cotton crop requires constant attention, but not much actual bodily labour; the land must be in fine order, and kept perfectly free from grass; the ground if poor, should be highly manured, and great care ought to be taken to guard against caterpillars, bugs, and other insects: for this purpose, ashes, gypsum, or a very small quantity of salt, may be occasionally laid around the roots, and the loose earth should be carefully drawn up to promote the growth of the plants, and prevent them from suffering by too much exposure to the cold winds. About the last of July my Roxboro' cotton was in blossom, and on the fifth of September, many of the pods arrived at maturity, and exhibited to view cotton of excellent quality. I allude particularly to the green seed cotton; the black seed or long staple had a thriving appearance, and yielded numerous pods, many of them the size of a walnut, but very few of them came to perfection. The long staple cotton, when cultivated on the sea-Islands of South Carolina and Georgia, is considered a most profitable crop; but does not succeed well beyond sixty or seventy miles from the sea coast, *even so far south* as those States. The green seed or short staple cotton can certainly be cultivated with success in the vicinity of the river Delaware in Pennsylvania, Jersey, and the State of Delaware, for domestic purposes; and *in some* seasons, in *favourable situations*, it might be an object of more importance with the farmer than either wheat or corn. The green seed cotton which was planted in my orchard, with the exception of a very few plants, was as luxuriant and bore as many fine pods, as could be met with either in the Carolinas or Georgia. The quarter of an acre produced

most abundantly; it would be difficult for me to say precisely, what quantity was gathered, but I am certain it exceeded a hundred pounds, forty of which I had picked before my departure for the south in October, and sent to my plantations where I saw it ginned out. On quitting my summer residence, I gave to the man who had prepared the ground, what cotton he might pick for his own use; he assured me, the pods continued to open until the end of December, during which time he thinks that more than sixty pounds were gathered by himself, and family, a great part of which being freed from the seed by the tedious process of hand picking, was worked up into very fine yarn; in addition to what was gathered I have reason to believe that several pounds were wasted and pilfered. In the Carolinas and Virginia, three hundred pounds of ginned cotton is an immense product to the acre, but two hundred on an average, is considered a fair and even a profitable crop; indeed I believe that *very few planters* make more.

[In another experiment of cotton in the same year as that of Dr. Tidyman's, by Mr. Gilpin of Kentmere near Wilmington Delaware, and communicated to the Society, it was found that "the plants continued very flourishing, and the pods to expand even after frosts, accompanied by ice, with the ground considerably frozen, and a succession of heavy storms and rain for one third of November, though with intervals of fine weather." The cotton seed planted was green, and had grown at St. Mary's Maryland; it was put in the ground by Mr. Gilpin, on the 2d of May, and in September the pods began to expand. The plants continued to bloom until the second of December.

Mr. Robert Car, at the Botanic Garden, late Bartram's, in Kingsess, in the same year, (1822) planted some of the St. Mary's Cotton Seed, upon a square of 32 feet, and obtained ten pounds of clean Cotton, which is at the

rate of 425 lbs. and a fraction to the acre. The Cotton was of good quality, and was made into Stockings.]*

* [At the instance of Mrs. Washington, about 25 years ago, I made trial of several species of *cotton*, and particularly of that kind cultivated in Virginia. I followed her directions, and added all the information I could otherwise obtain. I persisted during four years with assiduous perseverance. Some of the seasons were favourable, and some hostile. One season was similar to our present mild autumn (1825). But I could not succeed so as to encourage a continuance; and I abandoned the pursuit. I gathered very fine pods through the warm weather; but my main crop was invariably caught by frost, and ruined. If the pods could be sufficiently matured, before the heavy frosts arrived, they would not be injured and might be gathered at leisure. But I never could ripen them sufficiently. Even of those collected in summer, many were touched by disease, or injured by insects. Nor had I the ginn, to assist in the dressing. Others may be more successful, but none can take more pains. Circumstances now compel changes of our crops; and there may be localities more favourable to this plant, than others It would be well for farmers to begin, if only by way of experiment, some change in their culture; for the farinaceous plants we have heretofore cultivated, are now reduced so low, as scarcely to repay the labour and expense of raising them; especially where markets are liable to be glutted by products conveyed from great distances.

R. Peters.]

Extracts from Communications to the Society.

December, 1810.—Mr. John Shallcross of Wilmington Delaware, stated, in a letter to the President of the Society, that "in the month of March 1810, in taking off the second crop of hay, which lay on the top of the first crop, two eggs were found which must have been laid there by a hen, about the last of August 1809, the time the second crop was housed; upon examining them, they were found to be as fresh, as if they had been only 24 hours old: the whites had the appearance of fresh laid eggs, and the yolks were suspended in the whites. The hay that covered them was six feet or more deep: the eggs were found three or four feet from the inner edge of the mow, and more than that distance from the outside wall."

Mr. S. thinks the above facts shew that "the month of August is the proper time to put up eggs for keeping; and how they are to be laid up."

The opinion as to the influence of the time of year on the keeping of eggs coincides with that of Mons. Parmentier of France whose whole life was devoted to the dissemination of knowledge on domestic economy. In a memoir on the subject of eggs, he says that "eggs of the second laying preserve better than those of the first."* But it has been ascertained to the satisfaction of the writer, that eggs laid at any time will keep several months, provided they are completely covered with a varnish of some kind. Thick lime-wash has been used with com-

* Memoirs of the Institute of France, vol. 7.

plete success near Philadelphia. Reaumur says that the principle upon which the varnish acts; is, "by preventing the perspiration of the egg." Parmentier says that they may be preserved by "plunging them in boiling water, for two seconds, and that on taking them out, they should be marked, and used according to their ages." He adds, "eggs cannot long be preserved, after having undergone the least motion whether by land or water; for agitation disorganises the interior parts of the egg, breaks the ramification of the vessels by which the germ is attached to the membrane of the yolk, and this germ, deprived of the organs which preserve its life, dies, is corrupted, and spoils every other part of the egg. Thunder will also kill the germ."

March, 1822.—Mr. George Garth sent to the Society a specimen of the "round leaved Indian mallows plant (Sida Abutilon of the botanists) which had been partially water rotted, and prepared in the manner of hemp. The plant had been pointed out to him by Mr. Prosper Martin, as one from which, when a boy, he made strings. He supposes that 600lbs. might be raised from an acre of land. The fibre of the specimen sent was very strong.

January, 1823.—Isaac Conard, of Lancaster county Pennsylvania, suggests "the advantage that might attend the immersion of the butts of the stakes, (used in setting the fence he recommends,*) in a vat of lime-wash, for six or nine months, by increasing their durability. Upon mentioning the idea to a friend, he thought well of it, and recollecting an old deserted tan-yard, he went to examine its vats: he found the planks of the lime-pool sound,

* See pages 97, 98. (Erratum in the note—for "*furrowed*" read *farmed.*)

while all those used in forming the common vats were in a state of great decay."

March, 1825.—Dr. Kercheval of Bards Town, Kentucky, communicated an answer to Dr. Mease's inquiry of him respecting some particulars of a disease described by Dr. K. in the Medical Recorder of Philadelphia, Vol. 4. p. 445; and which was said to have been communicated to several persons who had flayed some cattle which had died of an epidemic disease in the year 1819.

The symptoms were swellings in the throat and breast, extending along the sides to the flanks, and uniting across the loins. These swellings were soft and elastic, and when cut into after death, were found to contain clotted blood, and coagulated lymph. The animals also frothed at the mouth, and appeared to be distracted. Death was often attended with violent agitations, and great distress. The disease lasted from four to twenty-four hours. It only appeared from the Months of June to September inclusive, and attacked horses, sheep, and horned cattle, whether grazing in wild or cultivated fields.

In the human subject, the first symptom was a small and circumscribed blister, containing a dark and turbid fluid, and gradually extending, formed a circular ulcer, which became livid, and finally gangrenous. The surrounding parts were hard and swelled, and affected with a loss of sensibility. Chills and fevers, attended by headache and pains in the joints, extremities, and along the course of the spine, succeeded, and, in one case, purple spots on the skin followed. In another, indisposition first appeared on a Friday, and gangrene in both hands the next day; on the following Wednesday, it had reached to the shoulder, when delirium occurred, and the man expired the next day. No person of colour was affected by the disease.

No cure was effected in the brute animals: but in the human subject, it was sometimes prevented by cutting out the parts first affected: and such was their insensibility, that the scalpel gave little or no pain; nor did the most powerful stimuli excite, for some days, the slightest sensation. Potash in substance, and a solution of Muriate of Ammonia (Sal-Ammoniac) in vinegar, and the compound tincture of Myrrh and Aloes, were found useful applications to the ulcers. The contiguous parts were at the same time covered with cloths dipped in the cold solutions of sugar of Lead in water. In five or six days, a circumscribed margin of red and healthy granulations announced the arrest of the gangrene. During the process of sloughing, Calomel was applied to the ulcers, and the Peruvian bark exhibited internally.

This account furnishes a useful caution to farmers, who, from motives of economy, often take off the hides of their cattle, which die of Epidemic or other diseases. The operation is never unattended by danger, whether the hands be wounded or scratched; or, as in the foregoing case, only immersed or covered with the infectious matter of the dead animal.*

* [I am informed by an intelligent person, whose business obliges him to traverse the parts of most of the Western States bordering on the Mississippi, and other navigable waters; that a disease, similar to the one described, frequently occurs among cattle turned out to feed in the forests; as many hundreds are, without any care or oversight of their owners. But the disease is not, to his knowledge, attended with such violent maniacal symptoms; though, in other respects, both as to duration and mortal effects, apparently the same. It is attributed to the cattle eating the young shoots of the *Buck-eye*,† (our Horse Chesnut) in early spring, when it is the most inviting of all the other forest food in those regions. The immense wastes, ex-

† *Æsculus Pavia.*

May, 1825.—Mr. Carey communicated the result of an experiment on the use of salt as a manure for grass. Upon a small lot in Philadelphia county, which appeared about six years since to be much out of heart, he strewed between three and three and a half bushels of salt to the acre. The first season he had a better crop by far, than the ground ever produced since it came into his possession. For four years he had good reason to be satisfied with the result. Two years since, he put on the same quantity with similar effects. The appearance of the grass, notwithstanding the drought of the season, was highly gratifying. The grass in the lot, is composed of red clover, and native green grass (*poa viridis.*)*

tending through several of the States, furnish, in Cane brakes, and chiefly, in vast bodies of lands covered with rushes, a nutritious green forage; which feeds thousands of cattle, very sightly in appearance; and many of them of fine forms and large sizes. The young shoots and tender foliage of the *Buck-eye* first put forth; and offer irresistible but destructive temptations. Their appetites and keen hunger conquer their instinct; which generally warns them to avoid noxious esculents. And it is well known, that many shrubs, vines, and other wild productions, are poisonous and fatal to some animals, though eaten by others, not only with impunity, but with wholesome nourishment. The young Buck eye plants start early, even in cultivated fields; and may be the occasion of the disorder, to grazing cattle in such fields; though it may not be the sole cause. The Buck-eye has an effect on the brain of cattle, so as to produce vertiginous affections. The diseased cattle shew excruciating bowel complaints, and very protuberant swellings. They stiffen in the joints, stagger, fall, and die. So that a drunken man is sarcastically said to have been eating *Buck-eye.* It is said, that the pulverised, or triturated nuts, or the inside bark, of the Buck-eye, will have the like effect on fish, with the *Cocculus Indicus.* I give this narrative as I received it. R. P.]

* [In the month of March last, I caused to be sown, on parts of a wheat field, at the rate of about four bushels of pure broken

May, 1825.—Thomas Wistar, Jr. of Montgomery County, Pennsylvania, stated in a letter to Dr. Mease, that "in the Autumn of 1822, he purchased a sow pig, with the intention of keeping her for a breeder. On the 24th of the 11th Month, she had a litter of seven pigs, and on the 27th of the same month, another litter of five, which were found dead. In the Summer of the following year, he was in daily expectation of another litter, but no pigs appeared. After the period had passed, when she ought to have furrowed, she refused all food, and shortly became extremely ill, with but little prospect of her living, for several days. A discharge of matter also took place, and continued, occasionally, until the 11th Month, accompanied by a loss of nearly all her hair. It being now evident, that it would be useless to preserve her any longer as a breeder, she was put with his store

down coarse *salt* to the acre. The wheat was strikingly benefitted, and became equal to the best of the crop on which no salt had been sown; though when I strewed the salt, the parts whereon it was spread were evidently inferior and unpromising. The whole field produced an excellent crop, it having been limed and dunged. *Now*, (September,) the clover and orchard grass on the salted parts are indubitably better, in colour and verdure, than they show in the other portions of the field. I attribute my having any grass on the salted parts, (which before salting looked very discouraging,) to the effects of that application. I occasionally turn in my dairy cows, and some fatting steers, into the field. They undeviatingly leave the unsalted parts and browze on those salted; although the grass looks generally good; and its appearance throughout the field inviting. The long and unprecedented drought we have passed through, appeared, from time to time as I viewed them, to have the most injurious effect on the unsalted parts; which, during the dry weather, looked sickly and unthrifty: compared with the grass on the parts on which salt had been strewed.

September, 1825. R. Peters.]

hogs, fatted well, was slaughtered on the 15th of December, and on examining her, the skeletons of a number of pigs were found in the proper place. Her weight was 200 lbs. and the meat very good.

This case shews a rare example of the power of an animal to bear up against great violence done to her constitution, arising from the derangement of her generative organs. No analogous fact, it is believed, is on record.

APPENDIX.

On transplanting Turf.—From the Hortus Gramineus Woburnensis, by G. Sinclair. London, 1825.

The following mode of returning tillage land to permanent pasture, called transplanting, is practised in England, and referred to in page 140 of this volume.

The mode of returning tillage land to permanent pasture, called transplanting, was invented by Mr. Whitworth, of Lincolnshire; and Mr. John Blomfield of Warham, Norfolk, first practised it to any extent, having, in the year 1812, converted thirty-two acres of tillage land by this mode.

In laying down land to permanent pasture by this mode, it is essential that the soil should be free of the seeds and roots of weeds, and made perfectly clean by a clear out-summer fallow. The Autumn is the best season for transplanting turf: and this should be selected from the very best pasture, for otherwise weeds and inferior grasses will be propagated.

If the field, from which the turf is to be taken, is intended to be broken up for a course of tillage crops, then the whole of the turf may be pared off, and employed in forming the new pasture. But should the field be required to remain in permanent pasture, a portion only of the turf must be taken from the field, and a sufficiency of the sward, or grass plants, left standing for that purpose.

In the first of these cases, Mr. Blakie directs a paring-plough to be used; but if that cannot be conveniently obtained, a common plough, with the coulter and share made very sharp, will answer the purpose; a wheel-plough is preferable to a swing-plough for paring turfs, because it goes steadier, and cuts the turf

more regularly. The turf should be cut about two inches and a half thick, and seven, eight, or nine inches wide, according to the nature of the turf-gage of the plough, and the width of the wing of the share; it is sometimes cross-cut into short lengths, previous to the operation of paring: but this can only be effected when the turf is moist, and free from stones. The cross-cutting is done by a scarifier with scimetar tines, the convex edges made very sharp, and faced to the work, and the implement heavily weighted, so as to press the tines a proper depth into the turf, into small pieces; but it gives more trouble, and increases the expense of filling into carts; for when cut into small pieces, in the first instance, it requires to be filled with shovels, whereas, if left in large flags, it is readily filled with forks or by the hand, when the turf is tough, and hangs together. The turf is taken in carts (if broad wheels so much the better) to the arable land on which it is to be planted, and then dragged out of the cart in heaps, set in straight lines, and at regular distances, in the same manner as dung-heaps are set in fields, and after the rate of fifty single-horse cart-loads to the acre. It is then chopped into pieces of about three inches square, and spread with shovels regularly over the ground. A scarifier with square or round tines, about one inch and a half diameter, and set about one inch and a half apart, or four times in a yard, is drawn regularly over the field, and again crossed at right angles, which takes out the cart-wheel tracts, levels the ground, and marks out the distances for placing the pieces of turf; but the operation of scarifying cannot be practised when the ground is wet. It is, however, much better when the scarifier can be used, as it not only marks out the distances accurately, but it makes an opening for the reception of the plants, at the angles where the tracts of the tines cross each other.

The turf being spread, women and children are then employed to place or plant the turf, one piece in each intersection formed by the tracts of the scarifier; and with the foot of a wooden rammer having a broad end to correspond with the size of the piece of turf, the plants or turf is pressed into the soil. One acre of turf divided in pieces, and placed as before described, will plant nine acres of arable land, as will appear from the following calculation.

Suppose one acre of turf cut into pieces of three inches square, it will produce 696,960 plants, or pieces of turf.

One acre of arable land, marked out in squares of nine inches to the side of the square, or eighty-one square inches, and one plant to each square, will require 77,440 plants: consequently, one acre of turf will plant nine acres of arable land; each plant will stand six inches apart, and occupy a space of nine square inches, the blanks in each square being seventy-two square inches, to be filled up by the future growth of the plants.

Mr. Blakie farther observes, that although this is the most common, and judged to be the most proper size for the plants, and distance for them to be set apart, yet it may not always be convenient to allow so large a portion of turf for plants to the acre. In that case, either the plants may be reduced or the distances apart extended.

The process for the second case, or when the field from which the turf is to be taken for transplanting is intended to remain in permanent pasture, is as follows:—the gauge of the paring plough may be set at nine inches, as before directed, but the wing of the share should be turned up at six inches, and, being made very sharp, will cut the turf on that side, while the coulter (also made sharp) will cut the turf on the other side; and the flat of the share will turn the turf out six inches wide, leaving ribs of grass three inches wide uncut. The cut turf being removed, the plough, set at the same gauge, is then drawn across the field, at right angles, to its former direction, and cross-cutting the uncut ribs of grass, will leave patches of grass three inches square in each angle, consequently the same number of plants to the acre as before stated in the calculation for transplanting. After the turf is removed, the field should have a good top-dressing, not less than thirty or forty loads per acre, of compost manure, or good vegetable mould. If the natural turf is deficient in any particular species of valuable grasses, the seeds of those should be sown at the proper season after the top-dressing is spread; after this the surface should be repeatedly well rolled. The turf will soon unite, and in many instances will be found materially improved from its former state, particularly so where the turf had been previously *hide-bound*, or mossed.

The turf may also be taken out of the grass-field in narrow ribs, suppose three inches wide only, leaving three inches uncut; then with a top-dressing of compost, and the ground thoroughly well rolled, the turf soon unites, and the herbage will be greatly

improved. In the operative part of transplanting turf, particular attention is required in carefully turning the flag with its grass side up, and in pressing the plants well into the ground; for if the roots of the plants are left exposed to the vicissitudes of winter weather, they will certainly be injured in a material degree. The whole process should therefore be effected with all possible expedition, particularly when carried on in winter; but which is not advisable, as frosts, more or less, are expected every night in that season: no more turf should be cut, carried, and spread in the day, than is likely to be planted before night.

No stock of any kind should be admitted upon the young pasture, until after the grasses have perfected and shed their seed.

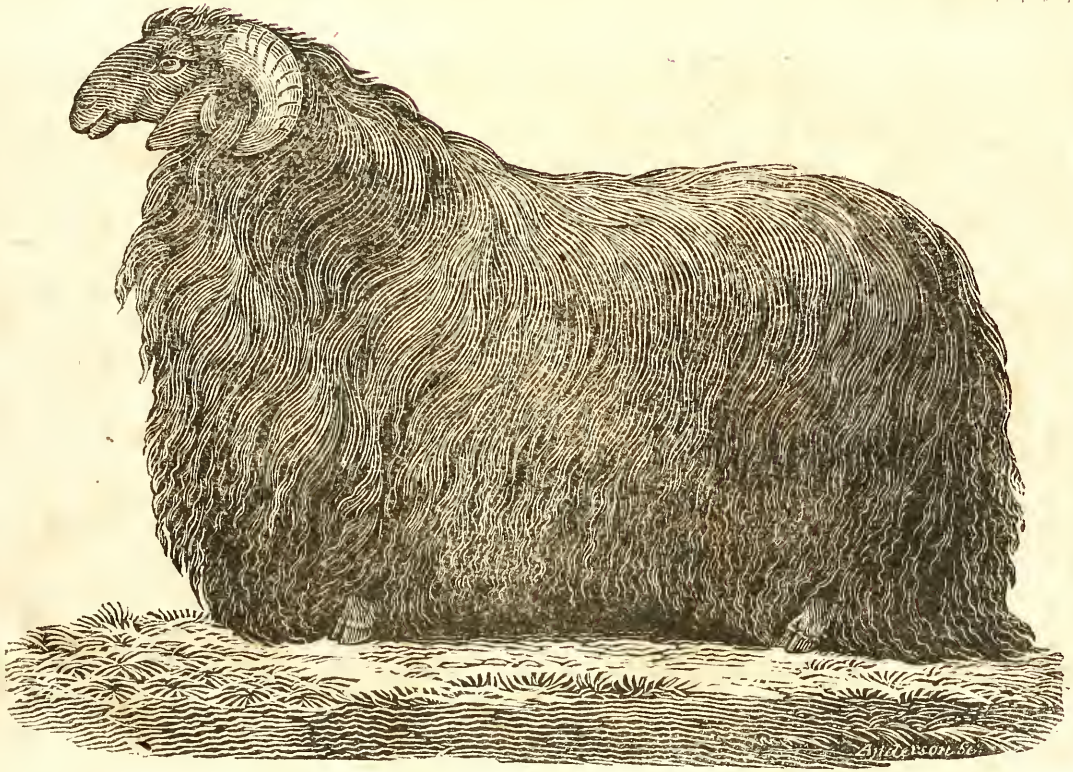
Mr. Forrester laid down to permanent pasture a field of sixteen acres; one half of the field was transplanted according to the mode above described, and the other half was sown with the seeds of natural grasses and clovers.

In both cases the pasture proved good, and equal to the best ancient pasture; but Mr. Forrester observes, that from the first year until now, (five years from the time the pasture was made,) that portion of the field which had been laid down with seeds has always produced more grass than the transplanted portion. In two other instances, one of a field of five acres, and another of two acres, treated in like manner as the above by Mr. Forrester, he obtained similar results.

On a farm of the Marquess of Tavistock at Oakely, before alluded to, I observed an improvement on the practice of transplanting turf; particularly as regards the recovery of a pasture partially deprived of its turf for the purposes of transplanting. It has been recommended to take the turf out in strips, or ribs, six inches wide, and to leave ribs of grass uncut, of three inches in width, to continue the pasture; but here the turf was allowed to remain in ribs of from ten to twelve inches wide, which, with the liberal use of the grass-roller, had the effect of sooner covering the vacant spaces with grass, or of promoting the union of the edges of the strips of turf, than when they were left of narrower dimensions. A piece of land in Woburn Park was planted with turf, but the expense of the process was here greater than what is mentioned above in the statements of expense. The turf was taken out in strips six inches broad, and ribs of grass left three inches wide, to continue the pasture, precisely according to the directions above given. The edges of the strips of

turf left standing to continue the pasture did not however approach or unite, so as to furnish the naked spaces with plants, because there were not any creeping-rooted grasses in the sward to throw out lateral roots and plants; and the naked strips or furrows caused by the removal of the turf, being very inconvenient to the feet in riding or walking over the ground, they had to be filled up with mould, and afterwards sown with grass-seeds.*

* The author takes this opportunity to inform his readers, that having entered into the firm of Cormack and Son, Nursery and Seedsmen, New Cross, London, and having made the actual raising of genuine seeds of all the essential permanent pasture grasses, clovers, and agricultural seeds of every description, one of the objects of his arrangements with that old established firm,—he therefore trusts, in a short time, to be able, from the New Cross Nursery, to supply the Agricultural public with these seeds at a price sufficiently low to insure a demand for general farm practice.


Anderson Sc.

The Caramanian or Camblet Wool Sheep.

"The Ram, of which the annexed is an excellent representation, is on W. Shotwell's farm, at Woodbridge, New Jersey, and was imported in the Charles and Ellen, Capt. Gerry, which arrived last Spring from Smyrna; he is from Caramania, in Asia Minor. He was taken from on board a Turkish vessel bound to Constantinople, and presented to Capt. Gerry by the Greek Admiral Tombazo, who assured him that he was a native of the above place, and that he would be a great acquisition to improve the breeds in this country. Their wool is peculiarly adapted to the manufacture of Camblets, and their flesh is esteemed excellent and delicate. This animal has a broad tail, and the wool is of a dark brown or snuff colour; the fleece, before shearing, dragged on the ground, (except under the belly,) so as completely to hide the feet, and weighed twenty-one pounds; he is in prime condition and sound health, the size greater than any of the largest sheep of our country. The head is beautiful, the eyes piercing and quick in motion; no fleece beyond the ears: the head appears to project out from the fleece, having the resemblance of the dark brown short fur on the deer's head; the horns are handsomely seated, and of the middle size.

"John Brentnal, an English farmer of high standing, residing in Woodbridge, in a letter to William Shotwell of New York, dated 10th June, 1825, says he took 21 lb. of wool from him, that he would have produced from 4 to 5 lb. more, had he not been robbed; that there were several places of 5 to 6 inches square from which the wool had been taken; further, he is extremely gratified with the frame of the animal; that he is large and perfect, his limbs well proportioned, his skin extremely de-

licate and white, his strength great; and that as he is but three years old, he will undoubtedly increase in size, and produce a still more abundant quantity of wool."

[The foregoing account of the *Caramanian* sheep, was presented to the Society as a curiosity, on which no practical knowledge here, suggests an opinion. A specimen of the *wool* may be seen in the cabinet of the Society; and it answers the description hereafter cited, being of the sort first mentioned. It is deemed worthy of mention for general information, so that if some of our spirited importers of foreign breeds of sheep, choose to add this to our stock, they may have every intelligence on the subject, so perfect a stranger permits. The province of *Turkey*, wherein it is indigenous, is mountainous, interspersed with rich vallies; and is of a temperature similar to many parts of the United States. Of whatever size it may be, suitable keep will be found in the variety of pasturage our country affords, in one or other of its sections. If the breed could be multiplied, it would introduce a new manufacture of *Camblets*, to which common wool, even of long staple, is not applicable; and thus add to the valuable varieties rising into important notice. The happy period is fast approaching, when our country will be independent, not only for the common articles of manufacture; but for all elegant and useful fabrics known in the civilised world.

There is little similitude between the wool of the *sheep* to which we are accustomed, and the fleece of this animal; which is, in fact, *sui generis* in this respect, and seems to be a species of *Mohair;* applicable to other fabrics than those manufactured from common wool, either of fine or coarse fibre. It is fitted (as it is said to be used in Caramania) for *Camblets*, and such stuffs. The animal, whereof the foregoing cut is the representation, is one of inferior description to the other kinds mentioned. Yet a specimen, now in the Cabinet of the Society, combed and dressed by a wool-comber; will shew the extraordinary value of the article. It is soft, somewhat silky, and uncommonly handsome. It can be extended to a length in the fibre, far beyond any wool known to us. The specimen is nearly a yard long, variegated, and mottled, and is really a curiosity of the kind. I do not pretend to point out to Manufacturers, the uses to which it can be applied: but cannot avoid recommending it to their attention. I am told that, notwithstanding the prohibitions of the Turkish government, and the monopoly of the nobles and priests of *Caramania;* the animals can be procured from *Smyrna*, without much difficulty. *Fiat experimentum.* I pronounce no opinion to govern that of others; (for I assume no such vain pretensions); having no information but that gained from the few writers I have had opportunities of consulting; as well as from some intercourse with voyagers who have been acquainted with the country in which the animal is found.

Extract from HARRIS's Voyages;—Vol. II. p. 278. *Other authorities might be cited.*—

"But, after all, the principal glory of this country, (*Caramania*) is its SHEEP; the wool of which is esteemed the finest in the world. They have a very singular way of coming at it: for, at certain seasons of the year, they pull it from the backs of the Animals with their fingers; so that the sheep are entirely naked. This wool is all wrought in its natural colours, and without dye. It is of three sorts; the first *brown;* the second of a *speckled grey;* the third of a *milk white*. This last is

the most esteemed; but there is none of it that ever goes out of the country; for it is entirely employed in making garments for their *Moulhas*, or Men of the Law, and *Priests*, who wear nothing else. There are in this province, more of the *Gubors*, *Gaurs*, or *Fire Worshippers*, who are the remains of the ancient *Persians*, than in all the Empire besides, and these frugal and industrious people manufacture, from the two other sorts of wool, several kinds of light stuffs; which, in point of beauty and lustre, are not at all inferior to *Silk*."

R. PETERS.]

MEMORIAL

OF THE

PHILADELPHIA SOCIETY

FOR PROMOTING AGRICULTURE.

To the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met.

The Memorial of the PHILADELPHIA SOCIETY FOR PROMOTING AGRICULTURE, respectfully sheweth,

THAT your Memorialists have been endeavouring for the last thirty-three years, to advance the interests of Agriculture in this State, and they flatter themselves that their efforts have not been in vain.

They have exerted themselves to concentrate the scattered rays of agricultural knowledge, to foster and encourage enterprise, to correct erroneous prejudices, and generally to excite a spirit of agricultural improvement.

Unaided by patronage, but relying on the zealous co-operation of a few individuals, they have persevered, under discouraging circumstances, to hold forth their glimmering lights, with the hope that as Agriculture is the basis of the prosperity of Pennsylvania, it would one day become its favourite, and that its protection could be with confidence looked for from the representatives of an agricultural and patriotic people.

Your Memorialists believe that the time has now arrived, when every thing which can promote the interests of Agriculture may be expected from the Legislature.

The convulsions of the old world, which agitated the new, having sunk to rest, and the conflicts of party having lost much of their violence, we naturally turn to the repair of those evils which have sprung from the neglect of our domestic affairs.

Hence, a spirit of internal improvement, which had been too long neglected, has sprung up; and faithful to this spirit, the Governor has, in a manner worthy of the Chief Magistrate of the State, recommended it to the attention of your honourable houses.

Encouraged by these propitious circumstances, we beg leave to propose for your consideration, a plan which we hope will increase the spirit of improvement already excited, and by a simultaneous effort in all parts of the State, give an impulse to Agriculture that will continue to be felt until the resources of this fertile State shall be fairly developed.

Your Memorialists think it would be a waste of time to attempt, even if their knowledge of the various parts of the State would justify it, to carry into them the agricultural improvement of which they are susceptible.

They therefore propose, that the Legislature should authorise the formation of an Agricultural Society, in each county of this State, and should appropriate a certain sum of money to be distributed in premiums, in some permanent form, by such Agricultural Society as may be formed in each county according to law.

This state is destined to be rich and powerful; but the basis of her power and wealth is the skill and industry of her inhabitants, in Agriculture.

The forests must yield to the plough, and the cultivated land must be fertilised.—How best to clear the former and enrich the latter, must be determined from local circumstances.

The clearing of the land can be best done by those who are accustomed to it, and the proper cultivation of it is to be determined by the nature of the soil, climate, proximity to market, and the resources for manure which may be accessible.

These must always depend on local circumstances and experiments, which can be best known and conducted by local societies.

The fertilisation of fields and the clearing of lands, will necessarily call for an increase of cattle, sheep, hogs, and other domestic animals.

How to accommodate these to the climate, and the subsistence of them to the modes of tillage, and the prevailing grass of the country, and to improve their breed, must be the result of observation and judicious attention on the spot, and cannot be more safely confided than to such societies.

Of the utility of premiums and the establisment of societies, we have daily proofs in our sister States, and in every European country whose Agriculture is flourishing.

Farmers and men of science have pressed forward into these societies, and combined their knowledge for the accomplishment of their laudable objects, and competitors for their premiums have been numerous and enterprising.

One illustration of this truth out of many is to be found at the last cattle show at Brighton, in Massachusetts.—A noble spectacle was there exhibited! All classes of people pressed forward for the prize, emulous only to be foremost in improving so important a staple of their country.

The show of cattle was succeeded by ploughing matches, and a crowded assembly witnessed the animated exertions of the competitors with unallayed pleasure, heightened by the reflection that to speed the plough, was to promote the public good.

Such generous emulation merits encouragement.

There are advantages in local societies, which although less glaring, are too important to pass without observation.

By meeting in these societies, farmers will have an opportunity of communicating their observations and experiments to each other, and of comparing the results; even unsuccessful experiments have their use—they are as beacons in an unknown navigation, and where men are acquainted with each other, false shame will not prevent the disclosure of them.

The most beneficial agricultural improvements have often been retarded by unsuccessful experiments, which ought to be known, to be remedied or avoided.

Experiments which may fail in one place may succeed in another, and thus the chances of success may be multiplied.

Small societies may meet more frequently, whereby knowledge may be imparted which might otherwise be forgotten, and zeal increased which might otherwise be diminished.

A better statistical knowledge of the State than the present might be obtained, and its wealth and resources become known and appreciated as well by the government as the people at large.

But above all by means of these societies, and the premiums distributed by them, beneficial experiments may be exhibited in every part of the State, which will have a greater effect in overcoming prejudices than the most conclusive reasoning.

There is not a farmer, who is worthy of the name that does not feel in passing the field or herd of his neighbour, excelling his own, a new incentive to industry and improvement;—he may not envy his neighbour, but he will endeavour to emulate him; —instruction and aid are at hand, and cheerfully given: thus a laudable emulation between individuals and counties will be promoted, and each by common consent will be advancing the prosperity of the commonwealth.

Pennsylvania is peculiarly calculated for an agricultural State, as well by her fertile soil as temperate seasons.

The North and the South have often looked to her as their granary, and have been fed out of the abundance of her stores. But the surrounding States are now making rapid strides in agricultural improvements.

The spirit has been awakened by the powerful influence of agricultural societies, patronised by their most distinguished men.

In the western parts of the State of New York, Societies have been formed, and by the judicious distribution of premiums have excited an emulation which is daily bringing into action the resources of our powerful neighbour.

Virginia is not idle; the late Presidents Jefferson and Madison, together with other distinguished citizens, have taken an interest in the promotion of agricultural societies, and thereby given a spring to improvement, which is spreading it over the State.

In the State of Delaware, an Agricultural Society was incorporated at the last session of the Legislature, which has already gone into operation, and distributed its premiums.

The proceedings in these States are noticed to shew the spirit of improvement which prevails there, and the benefits produced by their societies.

The advantages which might flow to Pennsylvania from the extension of agriculture, are too vast to be described.

With no higher degree of cultivation than that of England, she would be capable of sustaining a population of several millions of inhabitants, and of yielding an annual product of several hundred millions of dollars.

No certain data can be obtained for ascertaining the annual product of Pennsylvania; but the present population has been considered as capable by the fair improvement of the land now in cultivation, and the use of labour-saving machines in Agriculture, of doubling the product.

It may appear almost chimerical to calculate such an effect from agricultural improvements within our reach; but when we reflect on the powerful effects produced by them in other parts of the world, and in some in a short time, the calculation will appear more rational.

Shall Pennsylvania, rich in her soil, strong in the industry of her citizens, already in the first rank of agriculture, hesitate to commence a work, which has for its object to teach every farmer the path to wealth, and to stimulate him to tread it?

The patriotic ardour with which the citizens of Pennsylvania have hitherto supported public improvements, forbid us to doubt their hearty co-operation in promoting the greatest of all improvements, and that which is the basis of all.

It is particularly true of Pennsylvania, as it is said in the message alluded to, that Agriculture is the basis of manufactures; it is also the basis of commerce and of all internal improvements.

In vain are roads and canals constructed, if not for the transportation of produce. Increase the agricultural products, and the revenue of them will be increased accordingly: turnpike roads, which now yield but a trifling revenue to their stockholders, might in the end compensate them for their meritorious enterprise in making them, and canals would yield a revenue commensurate with the great expense of constructing them.

Let the State of Pennsylvania set the example of charging her political institutions with the protection and encouragement of Agriculture, and availing herself of the combined skill and la-

bour gratuitously offered, no longer to leave to desultory efforts a subject so essential to her prosperity.

By order and in behalf of the Society,

RICHARD PETERS, *President.*

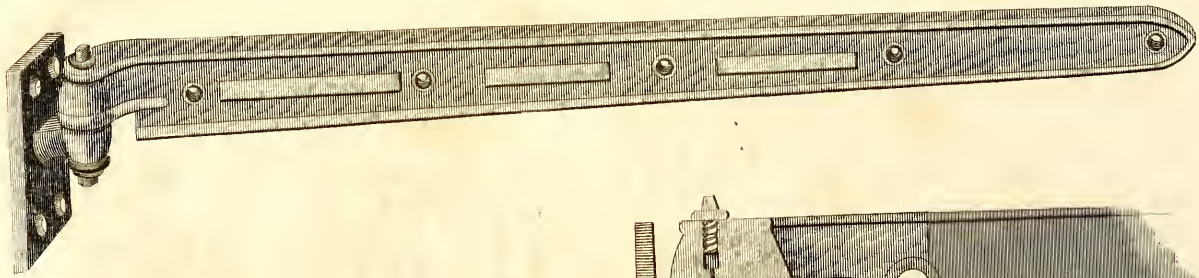
The foregoing Memorial was presented early in January, 1819, *and a law for establishing County Agricultural Societies was passed March 6th,* 1820.—*Several Counties have availed themselves of the provision of that Law.*

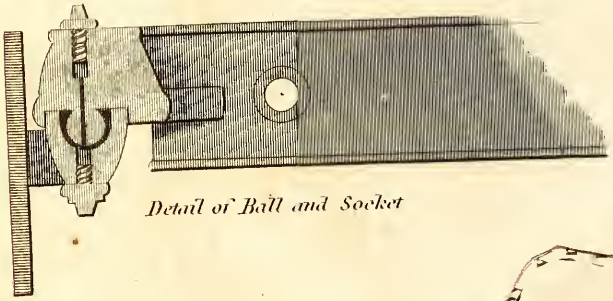
Collinge's Hinges.

The annexed plate of Collinge's Hinges gives so correct an idea of their construction, that any description is unnecessary.—They are calculated as well for doors as gates; and are made of different sizes. They move in oil, and totally exclude air and dust; and after a trial of them near Philadelphia, are preferred to any other hinges. The address of the inventor is J. Collinge, Bridge Road, near the Marshgate, Lambeth, England.

Plate 3.

Colling's Gate Hinge





Detail of Ball and Socket

Drawn by G. Strickland.

Engraved by Yeager.

INDEX.

A

B

C

FINIS.